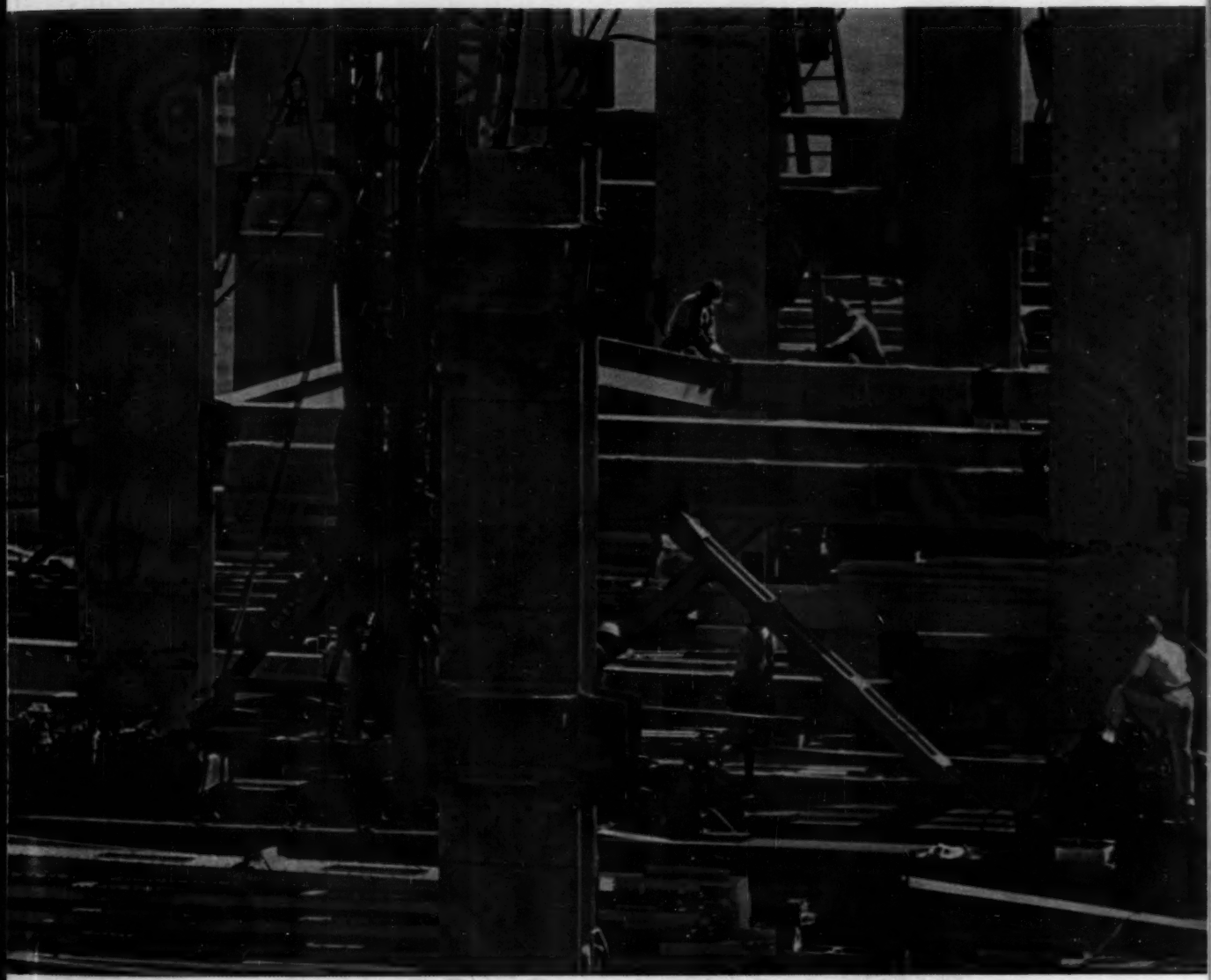
Construction Methods AND EQUIPMENT

OCTOBER, 1959

PRICE $1.00

A McGRAW-HILL PUBLICATION



Columns for the Chase Manhattan Bank Building in New York City are among the heaviest ever fabricated. Frame of the 60-story building will take 53,000 tons of structural steel.

CONTENTS, PAGE 4

Howard Stanton and son, James

"We've standardized 100% on Yellow Strand Flattened Strand!"

O. J. STANTON & CO., GREENWOOD, MISS.

WANTED: a modern wire rope to match the increased demands of heavier, faster, more powerful modern equipment.

Five months ago, O. J. Stanton & Co. found such a wire rope in Yellow Strand Flattened Strand. Today, their scrapers and dozers are 100% equipped with Yellow Strand Flattened Strand — in fact, they have used Yellow Strand Wire Rope for five years.

Stanton has found that Yellow Strand Flattened Strand outlasts round strand by a big margin — with considerable savings in total replacement time and rope costs — and a big boost to *going* time.

Your Yellow Strand Dealer — who is often the same man from whom you buy construction equipment — will gladly give you all the facts on Flattened Strand. Call him today!

Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.

Yellow Strand®

WIRE ROPE · SLINGS · CLIPS

B.F.Goodrich

B.F.Goodrich Rock Service tires reduce delays, save contractor up to $600 per hour

WESTERN CONTRACTING CORP. operates 2,000 vehicles to build highways, dams and air bases all over the country. Here the job is earthmoving for a new runway at Wright-Patterson Air Force Base, Fairborn, Ohio. The scraper above carries loads as heavy as 50 tons, works 22 hours a day. The tires are new B.F.Goodrich Rock Service, chosen because they substantially increase hours of service and reduce delays due to tire failure. Avoiding these delays saves the company $300 to $600 per hour in downtime expense.

Look at the husky double chevron Rock Service tread. It bites in to give maximum traction and resist side-slippage in forward or reverse. The B.F.Goodrich FLEX-RITE NYLON cord body withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks. This Rock Service body outwears even the extra-thick tread, can be retreaded over and over!

If you do earthmoving it will pay you to see the new Rock Service tire at your B.F.Goodrich Smileage Dealer's. He has a tire for every type of construction work. You'll find his address under Tires in the Yellow Pages of your phone book. *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment

Smileage!

B.F.Goodrich *off-the-road tires*

HOW TO HANDLE
WET JOBS

ONE LIFT REMOVES
18 FT OF WATER FROM
"PATCH-QUILT" SOIL

Sewage treatment plant, Clayton, N. J.
Contractor: C & T Affiliates, Inc.

SOIL on this job varied by area—fine silty sand here—coarse sand there—gravel a few feet away. This "patch-quilt" pattern precluded routine handling.

GRIFFIN engineers carefully planned proper installation for each wellpoint, using sand filters on some but not others.

This plus other special methods lowered the 18 ft of water with a money-saving single-stage wellpoint system. Top photo shows system placed directly at water level.

GRIFFIN
WELLPOINT CORP.
SALES • RENTAL • CONTRACT
881 E. 141st St., New York 54, N.Y.
Jacksonville, Fla. • Houston, Tex.
W. Palm Bch., Fla. • Hammond, Ind.
In Canada: Construction Equipment Co., Ltd.
In Venezuela: Drew Bear & Sons C.A.

Construction Methods AND EQUIPMENT

OCTOBER, 1959

Publisher—Robert F. Boger

Editor—Henry T. Perez

Managing Editor—Ross Hazeltine

Associate Editors—James G. Ripley
San Francisco: L. L. Wise
Washington: V. B. Smith

Assistant Editors—William G. Mooney
John Silinsh
Richard L. Bode

Presentation Editor—Joseph J. Fries
Assistant: Joseph R. Knisley

Editorial Secretaries—Carmella Pasqua
Rosemary McKenna

Business News—Manager: Elsie Eaves
Editor: James H. Webber

Domestic News Bureaus:

ATLANTA: B. E. Barnes • CHICAGO: Stewart W. Ramsey
CLEVELAND: Arthur Zimmerman • DALLAS: Marvin Reid
DETROIT: Donald MacDonald • LOS ANGELES: Kemp Anderson
SAN FRANCISCO: Janness Keene • WASHINGTON: G. B. Bryant, Jr.
SEATTLE: Ray Bloomberg

Foreign News Bureaus:

LONDON: John Shinn • PARIS: Robert Farrell
BONN: Morrie Helitzer • MEXICO CITY: Peter Weaver
BEIRUT: O. M. Marashian • CARACAS: John Pearson
MOSCOW: Robert Gibson • TOKYO: Sol Sanders

Advertising Sales Manager—David J. McGrath

Circulation Manager—E. F. Bressler

MEMBER
A McGRAW-HILL PUBLICATION
ABP

VOLUME 41 NUMBER 10

CONSTRUCTION METHODS AND EQUIPMENT, September 1959. Established in 1919. Published monthly by McGraw-Hill Publishing Co., Inc., James H. McGraw (1860-1948) Founder.

Editorial, Executive, Circulation, and Advertising offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice President L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary. **Publications Division:** Nelson Bond, President; Shelton Fisher, Senior Vice President; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venesian, Vice President and Circulation Coordinator.

Subscriptions are solicited only from persons engaged in construction or in supplying the construction industry. Position and company connection must be indicated on subscription orders.

United States subscription rate for individuals in the field of publication $2 per year, single copies $1.00; foreign $15 per year, payable in advance. Second class postage paid at New York, N. Y., and at additional mailing offices. Printed in U.S.A. Title registered in U.S. Patent office. ©Copyright 1959 by McGraw-Hill Publishing Co., Inc.—All rights Reserved.

UNCONDITIONAL GUARANTEE—We agree, upon request direct from paid-up subscribers to our New York office, to cancel any subscription if CONSTRUCTION METHODS & EQUIPMENT's editorial service is unsatisfactory, and will refund the proportionate subscription price of any unmailed copies.

SUBSCRIPTIONS: Send subscription correspondence and change of address to Subscription Manager, CONSTRUCTION METHODS AND EQUIPMENT, 330 W. 42nd St., New York 36, N. Y. Subscribers should notify publisher promptly of any change of address, giving old as well as new address, and including postal zone if any. If possible, enclose an address label from a recent issue of the magazine Please allow one month for change to become effective.

Postmaster: Please send Form 3579 to CONSTRUCTION METHODS AND EQUIPMENT, 330 W. 42 St., N.Y. 36, N.Y.

175

If you think your job is tough on wire rope, try Whyte Strand!

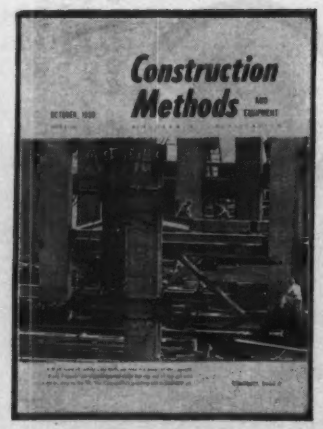
You'll find that Whyte Strand, made of sturdy improved plow steel, wears well, bends well, and has the "guts" to withstand plenty of punishment. You won't have to coax it along to get good service: The mileage and wearing life are built into the proven design!

Give Whyte Strand ropes a real trial—you'll get the kind of service that will make you want to put Whyte Strand on all your equipment!

MACWHYTE WIRE ROPE COMPANY
2900 Fourteenth Avenue, Kenosha, Wisconsin
Manufacturers of Wire Rope, Slings and Cable Assemblies
Distributed and Stocked Throughout the United States

For Shovel-Hoist Rope, Dragline, Clamshell-Crane Rope, Boom-Hoist Line, Dozer Rope, Scraper Rope, Contractor's Hoist and Derrick Rope, and Winch Line

Pay Dirt in This Issue



ON THE COVER

In the Wall Street area of New York City, crews of Bethlehem Steel Co. are completing the erection of 53,000 tons of fabricated structural steel for the 60-story Chase Manhattan Bank Building. It will be the sixth tallest skyscraper in the world. Three 70-ton guy derricks erect the massive steel frame.

DEPARTMENTS

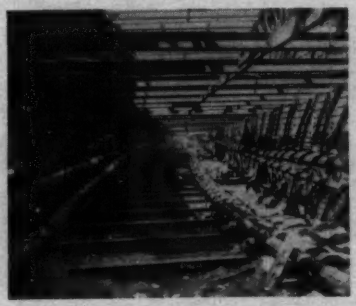
Construction News From Washington 11
Job Talk 20
Trends in the Machinery Market 41
Construction Business 47
Picture of the Month 57
Construction News in Pictures 63
Construction 'Round the World 68
Editorial 81
Construction Men in the News 144
Sales and Service 150
Construction Equipment News 156
The Maintenance Shop 185
New Publications 190
Methods Memo 198

NEXT MONTH

Concreting the twin 44x69-ft conduits for the Niagara Generating Plant is a huge operation. The walls are poured in two lifts; the arched roof requires three complicated forms. The contractor has mounted each type of form on a separate jumbo and has the pouring sequence down to a routine.

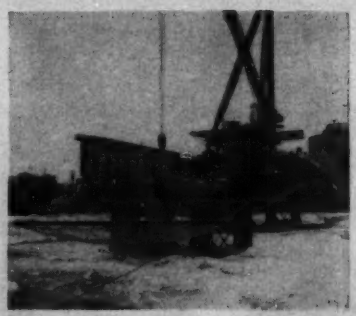
Contractor Tries New Dewatering Idea . . . 84

To dewater a 76-ft-deep trench by ordinary wellpoints would require a three-stage system. A new type of wellpoint, called an eductor, does the job in a single stage.



Steelmen Battle Niagara Rapids 89

The toughest problem in building a bridge across the swirling Niagara River is the falsework. Bethlehem Steel Co. had quite a time getting it to stay in place.



Runway Paving Hits Peak of 5,300 Cu Yd a Day . . 120

Three 9-yd mixers boost capacity of the concrete plant on this job to 450 yd per hour—enough to keep the paving train rolling at a steady 4,000 yd per day pace.

Twin Platforms on Barge Hold Drill Rigs 82
Building's Design Calls for New Techniques 99
Rebuilt Scraper Fits the Bill as Water Wagon 107
Rough Lumber Forms Cut Concrete Finishing 111
Fork Lift Truck Forms, Pours Walls 114
Here's How to Measure Pusher Potential 116
Elevator Rig Drills Holes in Face of Cliff 132
The Big Battle at Pook's Hill 135
Two Jobs for the Price of One 141

HERE'S THE BIG Gradall

Get versatility plus high production with this new giant Gradall

This new, versatile 200-horsepower addition to the Gradall line offers you all these money-making advantages:

1. Large buckets (up to 2 yards plus) give you big yardage.
2. Digs 18 feet deep — up to 25 feet with extensions — loading height of 18½ feet.
3. Powerful 360° continuous swing has two speed ratios selected automatically by the machine.
4. Lifting capacity up to 7 tons.
5. Provides 23,500-pound pulling force.
6. Gives a 30' 10" reach with its 15-foot telescoping action—47 feet with extensions.
7. Gradall's hydraulic system has new automatic hydraulic power booster.
8. All Gradall actions can be operated simultaneously.
9. All attachments can be "snapped-on" in a matter of seconds.
10. Boom tilts 120°—360° boom tilt optional.
11. Interchangeable from truck to crawler — in the field.

Gradall is also available on carrier-mount for fast "between job" moves and, in addition, provides a solid working base — regardless of the terrain.

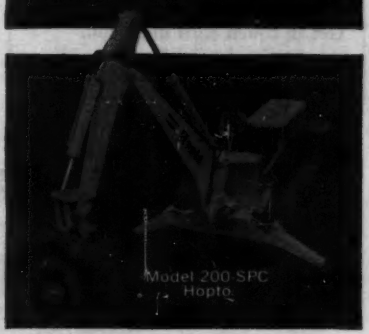
Arrange today with your Gradall Distributor to see this latest addition to the Gradall family. He'll show you how this more powerful, rugged machine can speed up all types of earth-moving operations . . . boost your overall job profits!

®Reg. U.S. Pat. Off.

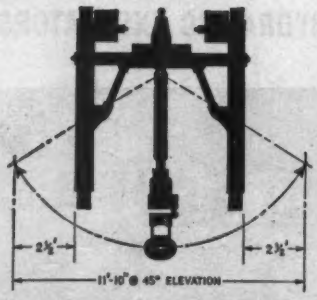
WARNER & SWASEY
CONSTRUCTION EQUIPMENT DIVISION
Cleveland 3, Ohio

MANUFACTURERS OF Gradall,® Hopto,® AND Duplex TRUCKS

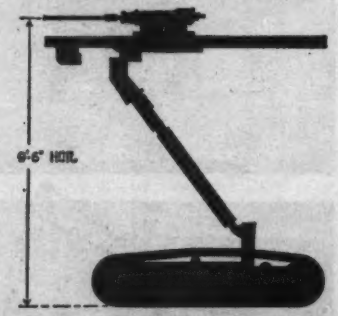
NOW WARNER & SWASEY BRINGS YOU THIS COMPLETE LINE OF HYDRAULIC EXCAVATORS..



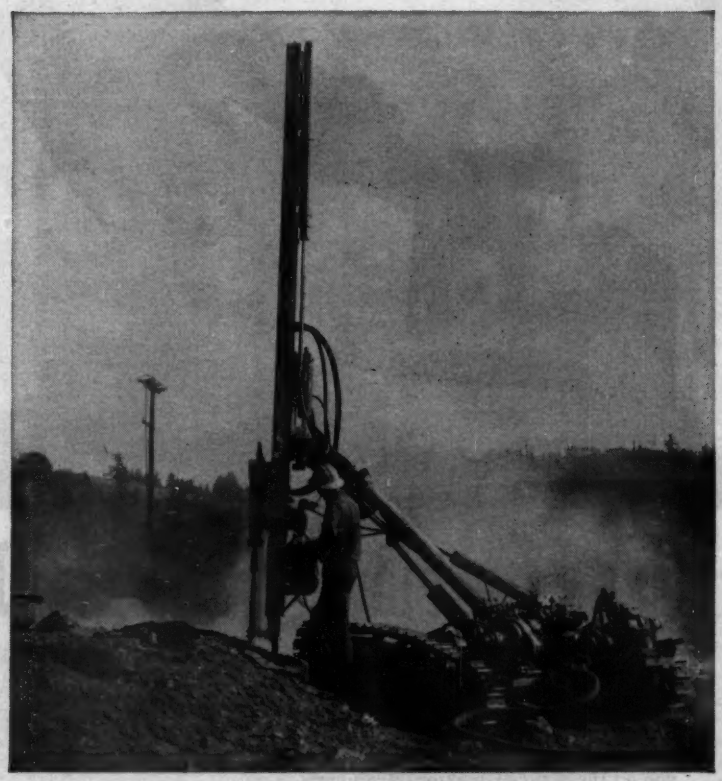
MORE SWING



...MORE REACH



...MORE FOOTAGE



with Gardner-Denver Swing-Boom "Air-Trac"®

TIME TO TALK TIME-SAVING

Gardner-Denver believes there's no substitute for men—it has been our philosophy of growth for 100 years. Your Gardner-Denver construction equipment specialist has helped many uncover ways to speed the pace . . . lower drilling costs. He's a good man to know. Get in touch with him soon.

Swings 11'10" . . . 2½' over both tracks Now drill more hole from one position . . . drill over a ledge from either side. Feed swings 11'10" at 45° elevation . . . moves to 2½' outside of each track with balanced stability.

Reaches to 9'6" height—for horizontal drilling Get better spacing of horizontal holes . . . reach to 9'6" for high breast holes.

Moves quickly . . . safely "Air Trac" is self-equalizing, self-stabilizing, with hydraulic track oscillation. Moves easily, safely over roughest terrain. Designed with an unusually low center of gravity for maximum stability. Long tracks and powerful crawler motors provide plenty of traction. "Air Trac" will pull its own compressor. Tracks available with rubber or steel pads.

Saves time . . . steps All controls conveniently located. Drilling and positioning controls grouped at the front of rig to save steps, setup and drilling time.

Pulls tight steel Powerful Gardner-Denver 5-cylinder radial air motor enables your driller to put the right pressure on the bit in all drilling situations . . . provides necessary pulling power to bring tight steel out of the hole.

Maintains hole alignment Easily handles in-line drilling . . . drilling in fitchery or fractured formations. Creep-free hydraulic boom keeps drill in position . . . track locks keep rig firmly in place in difficult drilling spots.

Drills fast, clean hole Gardner-Denver's line of powerful rock drills is most complete—six hard-hitting models to choose from.

Write for bulletin.

GARDNER-DENVER Since 1859 — 100 1959 YEARS

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario.

WALKING 95,000 lbs. OF STEEL

INTO PLACE!

It's the big problems that really test a crane and a 95,000 lb. steel beam is a big problem.

The job was a Chesapeake and Ohio R.R. overpass at Muskegon Heights, Mich. The contractor was L.W. Lamb Co., of Holland, Michigan, who has been building an outstanding name for himself in western Michigan by solving big problems.

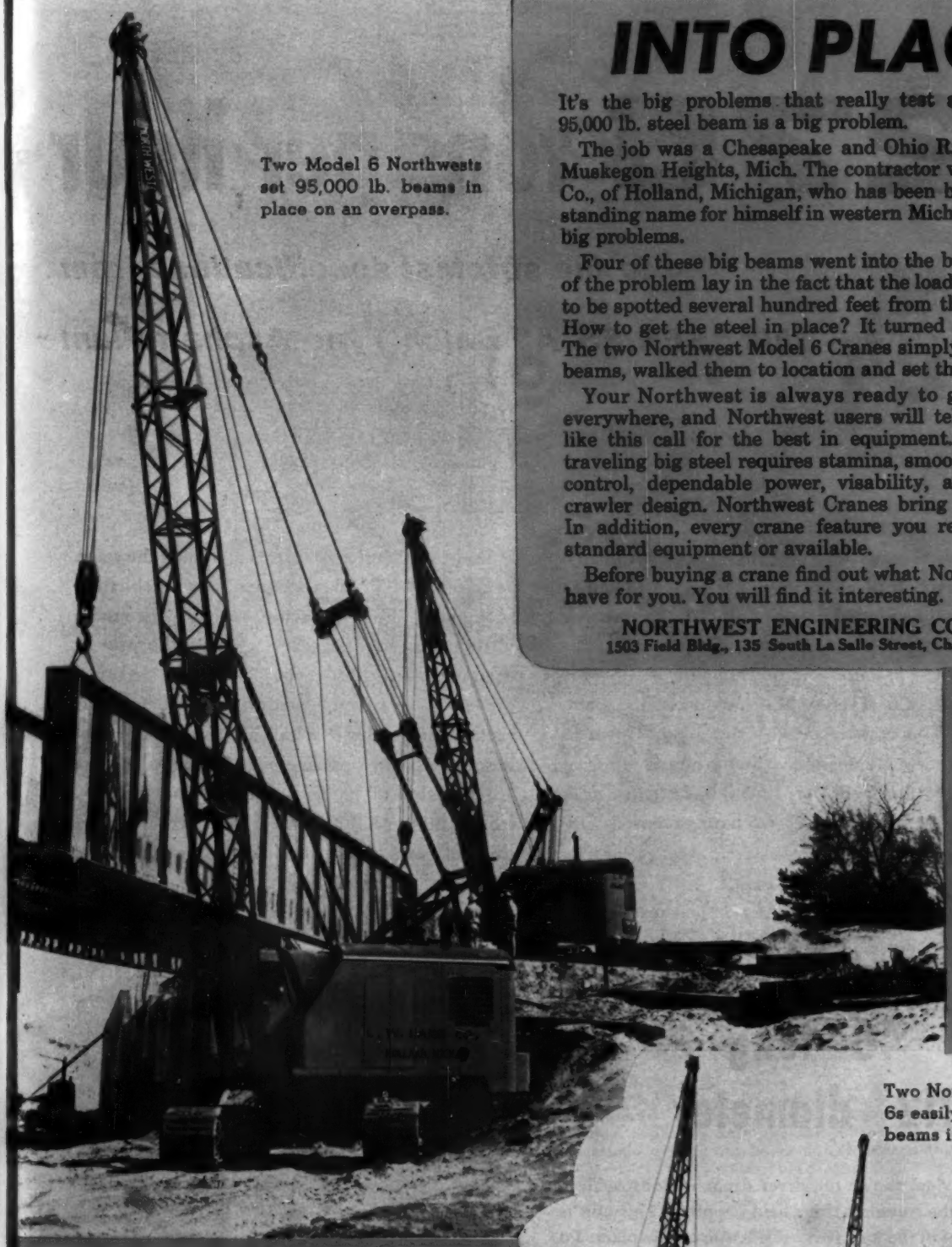
Four of these big beams went into the bridge. The crux of the problem lay in the fact that the loaded flat cars had to be spotted several hundred feet from the bridge piers. How to get the steel in place? It turned out to be easy! The two Northwest Model 6 Cranes simply picked up the beams, walked them to location and set them in place.

Your Northwest is always ready to go! We hear it everywhere, and Northwest users will tell you so. Jobs like this call for the best in equipment. Handling and traveling big steel requires stamina, smooth and accurate control, dependable power, visability, and sure-footed crawler design. Northwest Cranes bring you all of this. In addition, every crane feature you require is either standard equipment or available.

Before buying a crane find out what Northwest Cranes have for you. You will find it interesting.

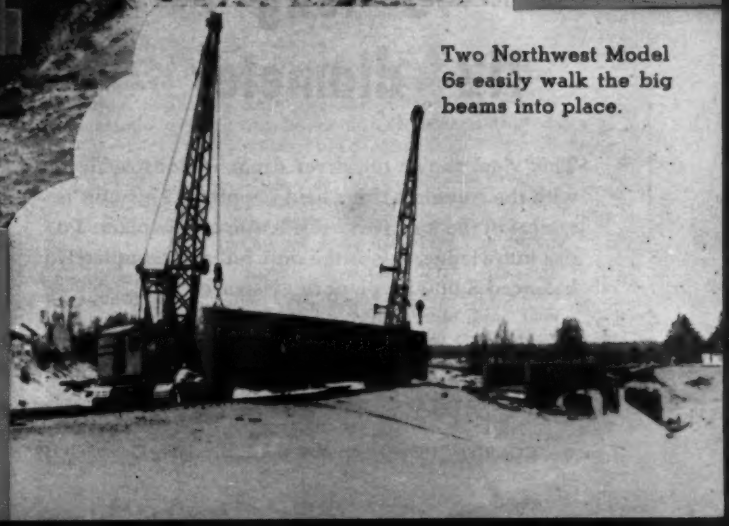
NORTHWEST ENGINEERING COMPANY
1503 Field Bldg., 135 South La Salle Street, Chicago 3, Illinois

Two Model 6 Northwests set 95,000 lb. beams in place on an overpass.



C-4-12-1C

Two Northwest Model 6s easily walk the big beams into place.



CRANES
SHOVELS
DRAGLINES
PULLSHOVELS
TRUCK CRANES

3/4 to 3 Cu. Yd. Capacity

NORTHWEST

275 tons per hour-

to the strictest specifications from this "SERIES A" Batch Type Asphalt Plant

• This recently installed H&B "Series A" batch type asphalt plant has been producing to and in excess of its rated capacity of 250-275 tons per hour.

George F. Patterson, of Trimount Bituminous Products Co., Everett, Mass., owner of the plant, says: "Our experience with the T-80 plant definitely substantiates your manufacturer's rating of 250-275 tons per hour. I would add that at peak hours on certain mixes we have exceeded your rating by 15%-20%."

Basically, "Series A" plants are much the same as our Type "T" plants which have established such outstanding production records since their introduction several years ago. To the proven design of the sturdy Type "T" plant, H&B engineers have adapted many improvements and refinements—a few of which are listed and briefly described on the opposite page. "Series A" plants are available in six sizes, with batch capacities from 2,000 to 8,000 lbs. For complete information see your H & B distributor or write direct.

Dryer Drum 40′ long 112″ diameter

This view shows the dryer drum in construction, with the trunnion rings being applied. This unit is typical of the massive construction of this plant. To our knowledge, this is the only full and completely balanced 8,000 lb. plant in existence.

HETHERINGTON & BERNER INC., INDIANAPOLIS 7, INDIANA

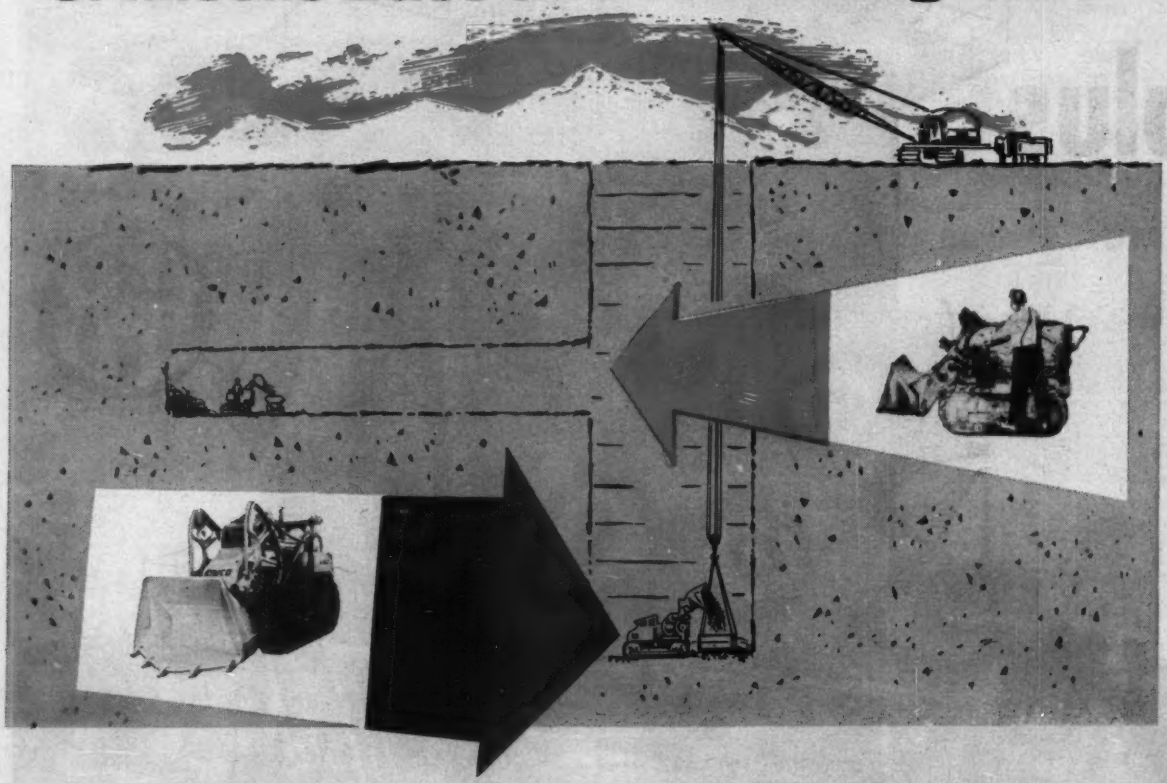
Export Dept., 205 W. Wacker Drive, Chicago 6, Ill., Cable Address "PANMAKINA"

A few of the many IMPROVEMENTS and REFINEMENTS – that make this increased production possible – even to the strictest specifications

- NEW . . . *Screens*—New model Deister Screens, 3½ decks, balanced design, all sizing decks full area.
- NEW . . . *Larger Hot Elevator*—Increased capacity, with new type chains and buckets.
- NEW . . . *Larger Dryers*—All models offer larger dryers, with lifter flight modifications to allow better air flow and improve aggregate distribution.
- NEW . . . *Oil Burners*—Maxon—Low Pressure.
- NEW . . . *Dryer Feed Hood*—Sealed to eliminate air leaks. Also internal chute to return dust to drum and eliminate accumulation in hood.
- NEW . . . *Fugitive Dust System*—Ducts built into elevator casing with separate exhauster and individual controls on all ducts.
- NEW . . . *Tower Stability*—Less screen overhang means less vibration. On the large screens, a dynamic braking system eliminates tower sway when screen stops.
- NEW . . . *Relocated Dust Elevator*—On same side as hot elevator, so return from dust collector can be put into hot or dust elevator as desired, without use of conveyor.
- NEW . . . *Electric Control Center*—Integral part of tower structure, with permanent wiring for mixer, air compressor, cycle control on mixer.
- NEW . . . *Optional Reject Bin*—For oversize from screen, with chute mounted on aggregate bin. Discharge to back of tower at driveway.

A wholly owned subsidiary of AMERICAN HOIST & DERRICK CO.

Economical, Efficient Construction of Missile Base and Launching Sites



On-The-Job Proven Solutions with the Eimco 105 and 630 Lines of Loaders

As the nation undertakes the building of underground ballistic missile complexes, American industry and ingenuity has already made available the specialized equipment necessary, and proven their efficiency in use.

Private enterprise has had to strive for utmost efficiency for low cost and large output in tunneling and excavating, both vertically and horizontally. Thus, when A. J. Cheff Construction Company won the subcontract for underground tunneling and shafts involved in the sinking of the Swift Creek 55 foot circular spillway and control shaft, they turned to a modern Eimco 105 Crawler-Tractor Excavator to do the job. The shaft was sunk to a depth of 950 feet, using one 105 excavator for all loadings of broken material from the shaft bottom.

The machine was lowered to the bottom onto the newly-blasted rock by an 80 ton mobile crane. The same crane was then used to lower and, after loading, hoist, a truck dump bed. Broken material was loaded on the shaft bottom by the Eimco 105, digging its way into the broken rock. Upon being hoisted, the dump bed load was dumped by swinging it into position over a Euclid truck, the "tag" line of the crane being used for dumping.

In shale, an Eimco 105 specially engineered short-coupled dozer with ripper attachment has been successfully used and in underground rooms, the excavator loads directly into a truck bed, carried on a flat-rack truck. Even in such tough assignments, the Eimco 105 excavator, which is diesel powered, showed a mucking rate as high as 125 cubic yards per hour!

In tighter areas, Eimco's famous 630 underground mining excavator, running on compressed air or AC or DC current, has proven its capabilities all over the world. With a production rate of 40 cubic yards per hour for the 630, production with either of these machines is limited only by the hoisting capacity available. The Eimco 126 Front End Loader has also proven itself as an efficient tunneling unit.

Thus, the combination of Eimco engineering and production knowledge and progressive construction company practices, has developed proven-on-the-job solutions to economical construction of intricate ballistic missile complexes and similar projects. For further facts, data and courteous, qualified consultation, write The Eimco Corporation, P. O. Box 300, Salt Lake City 10, Utah.

"ADVANCED ENGINEERING AND QUALITY CRAFTSMANSHIP SINCE 1884"

THE EIMCO CORPORATION

TRACTOR LOADER DIVISION

604 SOUTH 4TH WEST
SALT LAKE CITY, UTAH — U.S.A.

EXPORT OFFICE: 51 - 52 SOUTH STREET, NEW YORK, N. Y.
BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

Construction News From Washington

Washington, D.C.
October, 1959

Federal Work Gets a Boost

Congress did a good job for construction in the session just ended. The lawmakers molded, remolded, and finally pushed through bills that preserve and, in some cases, strengthen existing construction programs for highways, airports, public housing, urban renewal, college housing, reclamation, flood control, and navigation.

These accomplishments fall short of the goals proclaimed by Democrats last January. But they establish a higher level of public construction than the Eisenhower Administration proposed.

This year's construction legislation, however, was not aimed exclusively at prying open the government purse. On construction spending for military installations, the legislators reduced the Defense Department's appropriation request first by forcing a settlement of the Army-Air Force rivalry over their Nike and Bomarc missiles and second by eliminating or cutting other items.

67 New Public Works Projects

When Congress overrode the President's veto of the $1.2-billion Public Works Appropriation Bill, it handed the chief executive a problem: what to do about the 67 new starts he didn't want but was forced to take.

Whether he withholds or releases the starting funds Congress voted will determine the timing of construction starts on these projects.

Scheduling of bid invitations and contract awards for the new projects—they will cost more than 80 million to complete—hinges on the President's decision. But there is little doubt that the 67 projects will be started sooner or later.

Housing Programs Continue

The housing bill the President signed late last month assures continued expansion of key housing programs:

- Urban Renewal—The measure carries $650 million for new slum clearance projects over the next two years. Already, states and communities have plans for something like $500 million in new urban renewal projects. Failure to pass a bill this year would have shelved, perhaps permanently, many of these projects.
- College Dormitories—$250 million is provided. HHFA for a year has been accepting tentative applications for such construction from colleges. The legislation now gives the agency authority to go ahead

and approve these projects as well as accept new applications. Dropped from the bill was a Democratic-sought feature to provide $50 million for construction of college classrooms and laboratory facilities.

• Public Housing—Provides for 37,000 new units. Some 100,000 units previously authorized are still to be built. The new authority allows continued planning in this field.

• A new feature grants $50 million to states and localities for construction of housing for elderly persons.

In addition $8 billion of new mortgage insurance authority was given FHA—enough, it's estimated, to take care of the demand for another year.

Tight Money

Construction contractors may be hard hit by tighter money this fall. That's because a lot of construction projects generally get a low priority from lenders.

Demand for money is rising sharply. Retailers need credit to finance Christmas stocks; industry is seeking funds for rising plant and equipment capital expenditures; and the government is coming into the short-term market heavily to sell its securities. In the banker's eyes, these are better credit investments now than many private construction projects.

Sharing The Highway Money

There will be complaints about the apportionment of highway construction funds by the Bureau of Public Roads. Congress set the interstate authorization level at $2 billion but provided only enough money for $1.8 billion in interstate apportionments.

Highway Administrator Bertram D. Tallamy says some type of "contract control" is needed to get a uniform rate of spending by states to match the inflow of tax revenue into the Highway Trust Fund. Reason is simply the shortage of federal money to pay for the new roads.

Even with the 1¢ increase in the federal tax on motor fuels and some temporary borrowing from the Treasury, Bureau of Public Roads officials say $157 million in state highway vouchers will have to be held up for payment at the end of the fiscal year for two to three weeks until money for the next fiscal year is available.

This situation provoked Senator Albert Gore (D-Tenn.) to protest to the White House. Sen. Gore said the combination of controls over state contracting and the delayed voucher payments would "clearly undermine the validity of an apportionment of funds."

Sen. Gore said in his letter to the President that he would support action in Congress when it meets next January to appropriate money from the Treasury to cover any anticipated deficits in the Highway Trust Fund so that all state vouchers would be paid promptly when due.

CATERPILLAR SELECTS VICKERS VANE PUMPS

"HIGH PERFORMANCE" PUMPS PICKED FOR NEW SERIES H EQUIPMENT

Continuing critical selection and evaluation of all component items used on its machines helps make Caterpillar Tractor Co. outstanding in its field. Thorough engineering, advanced manufacturing, and top-quality materials result in cost-cutting construction equipment . . . the new D8 Series H Tractor, No. 8 Ripper and No. 583 Series H Pipelayer.

To assure dependable hydraulic power on these machines, Caterpillar specifies the Series 25, Series 35 and Series 45 Vickers "High Performance" Pumps as original equipment.

VICKERS "HIGH PERFORMANCE" PUMPS (larger sizes and double pumps soon to be released) represent the most complete range of high speed, high pressure pumps for construction and material handling equipment ever offered. Send for **BULLETIN M-5108** for further information and performance characteristics.

Complete pump overhaul in 10 minutes in the field...

Replacement cartridges for "High Performance" pumps contain all normal wearing parts and insure "As New" results. Following vehicle manufacturer's instructions, cartridge can be quickly changed without removing pump from vehicle and usually without disconnecting hydraulic lines. Caterpillar Dealers provide cartridges and replacement service in the field.

8282

VICKERS INCORPORATED
DIVISION OF SPERRY RAND CORPORATION
Mobile Hydraulics Division
ADMINISTRATIVE and ENGINEERING CENTER
Department 1400 • Detroit 32, Michigan

Application Engineering Offices: • ATLANTA • CHICAGO • CINCINNATI CLEVELAND • DETROIT • HOUSTON • LOS ANGELES AREA (El Segundo) MINNEAPOLIS • NEW YORK AREA (Springfield, N.J.) • PITTSBURGH AREA (Mt. Lebanon) • PORTLAND, ORE. • ROCHESTER • SAN FRANCISCO AREA (Berkeley) • SEATTLE • ST. LOUIS • TULSA
ALSO SOLD AND SERVICED IN AUSTRALIA, ENGLAND, GERMANY & JAPAN
IN CANADA: Vickers-Sperry of Canada, Ltd., Toronto, Montreal & Vancouver

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

Western moved and replaced over 4 million yards of earth in building special $13,000,000 Jet runways for S.A.C. at Wright-Patterson A.F.B. Western is pushing for November 1959 completion of runway, ramp and taxi areas. They're using Texaco 100%.

Western uses Texaco Lube Plan

Problem: build a runway two miles long, two feet thick, and tough enough to take the landing shock of planes as heavy as a locomotive—a priority project that must be finished early in 1960. Western Contracting Corporation, Sioux City, Iowa, is moving ahead on this one right now, at the new $22-million Strategic Air Command Wright-Patterson Air Force Base near Dayton, Ohio. And to help make sure they finish on schedule, Western relies on a Texaco Simplified Lubrication Plan.

Here's how it works. The Texaco Plan cuts total lube inventory down to six products. That way, each of Western's lube rigs is a complete service station on wheels, able to lubricate every piece of equipment, wherever it is.

The low inventory Texaco Plan cuts chances for misapplication, too. It saves

Western's Texaco Plan enables mobile rig to handle all major lubrication in the field—eliminates wasteful deadheading.

to pave the way for S.A.C.

manhours in storage and handling. It cuts paper work in ordering. And every lubricant in Western's Texaco Plan was chosen to meet the specific requirements of the job.

Cut costs on *your* next job. Get all the facts on the Texaco Simplified Lubrication Plan from your Texaco Lubrication Engineer, or write:

☆ ☆ ☆

Texaco Inc., 135 East 42nd Street, New York 17, New York.

Tune In: Texaco Huntley-Brinkley Report, Mon.-Fri.-NBC-TV

☆ ☆ ☆

TEXACO

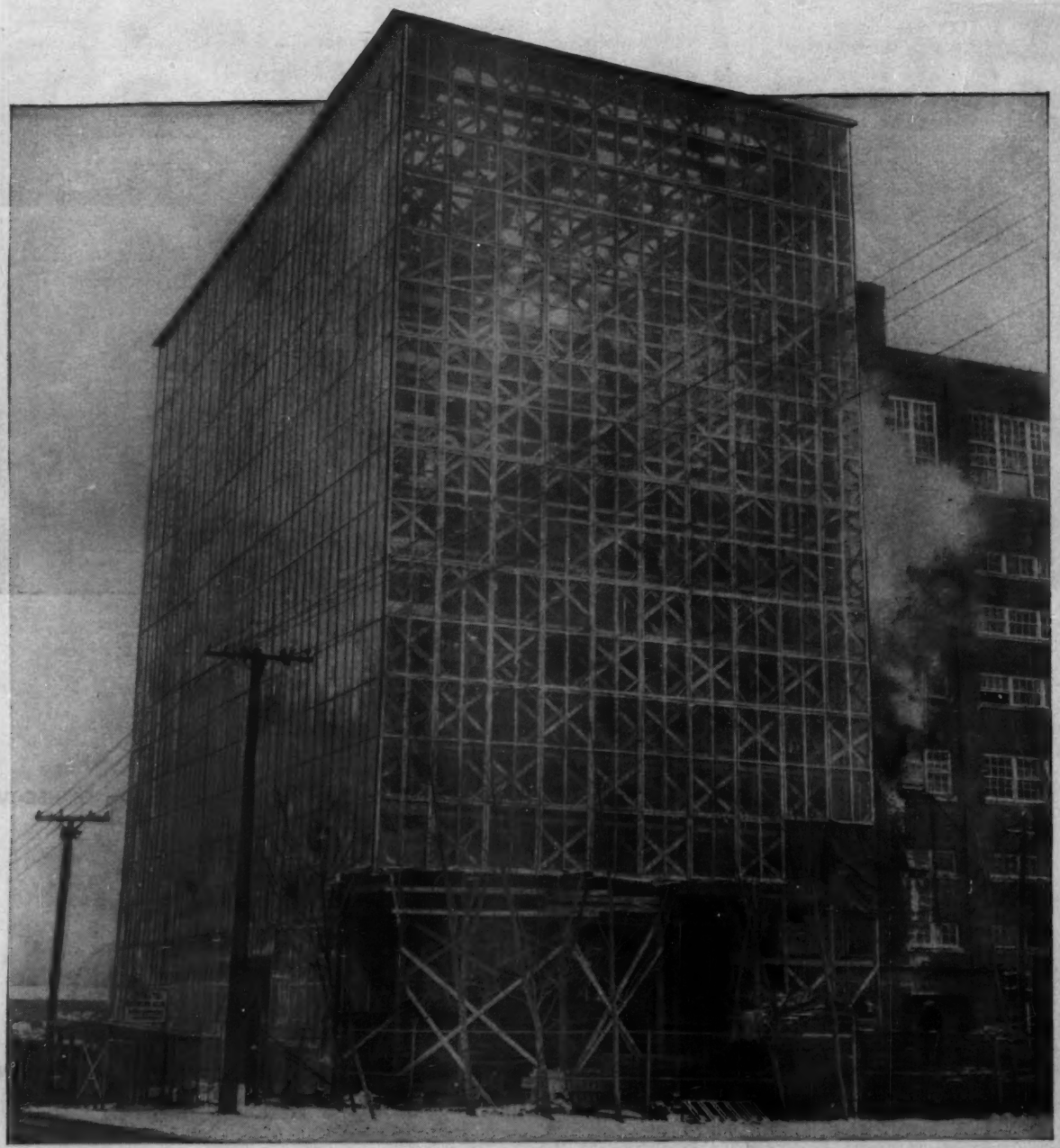
Throughout the United States
Canada • Latin America • West Africa

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

Announcing

New high quality Du



ECONOMIC METHOD FOR EARLY ENCLOSURE. Du Pont Polyethylene Film permits continuation of work in spite of inclement weather . . . doesn't cut off needed light. Early enclosure helps maintain work schedules . . . helps cut costly work delays! When film is used on building frames, it can be retained under permanent siding for moisture-vapor barrier.

Pont Polyethylene Film

Early enclosure of building with Du Pont Polyethylene Film helps you maintain work schedules . . . cuts costly delays

Here's a new, high-quality polyethylene film that will help you maintain work schedules, protect costly materials and provide a harder cure for concrete.

By specifying Du Pont Polyethylene Film, you can be sure of consistent high quality at the lowest possible cost. That's because Du Pont has over 35 years of experience in manufacturing industrial films, such as cellophane, acetate, and "Mylar"* polyester film.

Tough, durable Du Pont Polyethylene Film is available in a wide variety of gauges, lengths and widths, assuring you the right film for every "on-the-job" use. And, most important, suppliers of Du Pont Polyethylene Film, with years of experience and know-how, can provide helpful, cost-saving suggestions for using the film.

When planning your next building start, check with your supplier of Du Pont Polyethylene Film. Ask for Du Pont's new "Specification Booklet" with suggestions that will help you cut costs . . . maintain work schedules . . . protect valuable equipment and materials. If your supplier is temporarily out of stock, write Room CM-10, E. I. du Pont de Nemours & Co. (Inc.), Film Department, Wilmington 98, Delaware.

*"Mylar" is a registered trademark for Du Pont's brand of polyester film.

DU PONT
REG. U.S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

DU PONT polyethylene film

PROTECTS MATERIALS AND EQUIPMENT. Expensive building materials and equipment are fully protected against rain and dust . . . blanket of polyethylene film keeps building materials from freezing together. Du Pont Polyethylene Film is lightweight, easy to handle, tough and durable.

PROVIDES HARDER CURE FOR CONCRETE. Economical Du Pont Polyethylene Film helps retain moisture . . . allows concrete to cure at a natural rate for optimum strength. By eliminating repeated waterings, you cut costs . . . finished surface is hard and clean. Film can be re-used.

on tires or tracks...

Cummins diesels earn

the most profit!

CUMMINS

You can save as much as 50¢ per hour per unit with Cummins Diesels compared to other construction diesels. Coupled with this unequalled economy is the ease of maintenance, dependability and long life that has made Cummins world famous. It's the power that earns the profits! There are more than 30 Cummins construction models from which to choose-70 to 600 horsepower. Each is specially designed for heavy construction usage. Leading equipment manufacturers make Cummins Diesels available in more than 400 construction machines of every size and type. Another reason why Cummins Diesels earn more profit is the excellence of the Cummins Distributor network. More than 350 locations throughout the U.S. and Canada offer genuine Cummins parts – skilled, efficient low cost service. Specify the power that earns more profit-

Standardize on Cummins

Cummins Engine Company, Inc., Columbus, Indiana

LABYRINTH WATERSTOPS

A SOUND INVESTMENT FOR CONCRETE CONSTRUCTION!

LABYRINTH AVAILABLE IN 2, 3 or 4 rib.

ON YOUR CONSTRUCTION:

1. Consider the investment in design, materials and labor (to mention a few).

2. Then consider how important safe, secure *watertight* concrete joints are.

3. Thorough watertightness *can* be secured by installing Labyrinth Waterstops —a dividend that makes the low initial cost of the product insignificant when compared to your total investment—and one that insures watertight concrete joints for years!

- Corrugated ribs grip concrete, insure an everlasting bond between joints.
- Finest polyvinyl plastic resists chemical action, aging, severe weather.
- Takes just seconds to nail to form . . . easy to cut and splice on location (prefabricated fittings available).
- There's a Water Seal product for every type of concrete work!

If your aim is to stop water seepage, *stop it effectively with Water Seals' Waterstops!*

"See Us in SWEET'S"

New Literature and Free Samples Sent on Request—Use Coupon Below

WATER SEALS, inc.

9 SOUTH CLINTON STREET, CHICAGO 6, ILL.

Made in Canada for J. E. Goodman Sales, Ltd. Toronto, Ontario

WATER SEALS, INC. DEPT. 2
9 S. Clinton Street
Chicago 6, Illinois
Please send free sample and descriptive literature.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

Job Talk . . .

Track Cable Boosts Dragline Capacity

On a channel deeping project on the Rio Grande River, contractor Joseph C. Hastings, Albuquerque, N. M., increased the capacity of his ¾-yd dragline by using a track cable with a lightweight 1½-yd bucket.

All hauling was at ground level, so a bottomless Sauerman Crescent DragScraper, which automatically dumps its load when lifted, replaced the regular dragline bucket. The rig scooped 6,000 yds of material from the river, deepening the channel about 8 ft.

The hoist line of the crane served as a track cable. It was fastened to an old tractor that traveled along the opposite bank. Operating span was about 200 ft. Gravity return of the DragScraper down the inclined track cable helped make the channel cut an economical operation.

Pipe Burrows Under Streets

Streets torn up to make way for new sewer lines annoyed the residents of Klamath Falls, Ore., so project engineer Maurice Gunderson built a special rig to place pipe under the streets without digging a trench.

The rig is a glorified screwdriver. A 5-ft-long steel auger inserted inside the leading 5-ft-long section of composition pipe, drills through the material ahead of the pipe. A 9-hp gasoline engine powers the auger. A hand-oper-

Today's finest crankcase oil for super-charged diesels

...standard of comparison for over ten years

Today . . . as for 10 years past, Shell Rimula Oil proves more than a match for the greatly increased engine ratings, high temperatures and pressures of modern high-performance diesels. Rimula® Oil successfully tends to resist every destructive force that accelerates engine wear.

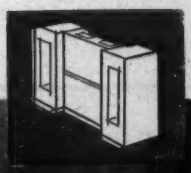
Let a Shell Representative show you the benefits of using Shell Rimula Oil. Write to Shell Oil Company, 50 West 50th Street, New York 20, New York, or 100 Bush Street, San Francisco 6, California. In Canada: Shell Oil Company of Canada, Limited, 505 University Avenue, Toronto 2, Ontario.

SHELL RIMULA OIL

—the heavy-duty diesel lubricant

SHELL

Great new things are shaping up in concrete block



Architect Marcel Breuer, New York, alternated hollow-core units and standard 4" x 8" x 16" concrete blocks to create this striking masonry wall. PHOTO COURTESY NATIONAL CONCRETE MASONRY ASSOCIATION.

Atlas Masonry Cement provides the right mortar

Concrete blocks in a range of new designs . . . colors . . . and textures are being used to create unusual and distinctive effects in masonry construction. For structural or decorative use, indoors and out, the economical concrete block is now a major design element in today's building plans. And to lay up these new concrete masonry units, Atlas Masonry Cement continues to be the preferred basic material for mortar. It helps produce a smooth, workable mix . . . assures a stronger bond . . . gives weathertight joints that are uniform in color . . . complies, too, with ASTM and Federal Specifications. For information, write: Universal Atlas Cement, Dept. M, 100 Park Avenue, New York 17, N. Y.

M-77

"USS" and "Atlas" are registered trademarks

Universal Atlas Cement
Division of
United States Steel

OFFICES: Albany · Birmingham · Boston · Chicago · Dayton · Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh · St. Louis · Waco

ated chain drive pushes the pipe along as the auger advances. A metal track guides the auger and holds the pipe sections that are added as the leading section moves ahead.

The specially cut auger bit works equally well in mud, clay, sand, or hard chalk. Drilling time for pipe crossing underneath a 25-ft-wide street averages 30 min.

French Throw Light On Tunnel Surveying

Photographs of tunnel cross sections outlined by a projected plane of light are the key to a low cost method of surveying developed by the French national coal authority.

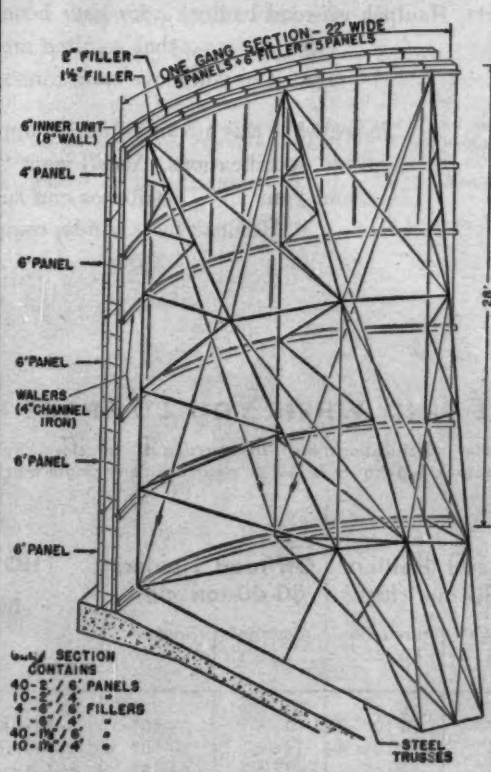
In the projector, a standard Oldham-Arras mine lamp, rated at 2½ v and 2 amps, is the light source. A 7-in.-dia ring of plastic projects the light in a 360-deg plane. When set up at a station on a standard tripod, the projector is leveled to make sure the illuminated plane is absolutely vertical. A sign at the base of the projector stand identifies the station.

The camera is then set up at a distance so that the entire cross section marked by the plane of light is visible in the viewing glass. The tripod holding the camera is adjusted to put the objective lens on the same level as a reference point on the projector. Then the photograph is taken.

Area of the cross section is determined from an enlarged print with a planimeter. Scale is established by measuring the apparent length of two 45-in.-long aluminum tubes fixed at right angles to each other on the projector stand.

New use for Symons Steel-Plys in gang forming...

28' CIRCULAR WALLS GANGED FOR SEWAGE PLANT



2,300 square feet of forms on inside ganged section stripped and reset by crane in 3½ hours.

8 men in less than 8 hours erected 2,300 square feet of forms and scaffolding on outside plus pouring the concrete.

Friebel & Hartman, Shelby, Ohio contractor ganged Symons Steel-Ply Forms on the Mansfield, Ohio Sewage Treatment Plant. The project consisted of four digestors, each 80 feet in diameter and 28 feet in height and 8 inches thick with no horizontal joints.

4 Ton Sections

Four ganged sections were used—each 22 feet wide and 28 feet high. This allowed pouring ⅓ of a tank at a time. Each ganged unit consisted of four rows of 6' Symons Forms and one row of 4' forms to make the 28' height. Three trusses were used to brace each ganged section. A ¾ yard Lorain with an 80' boom handled the sections.

One Pour Every 4 Working Days

What is the Friebel & Hartman verdict on using this method of pouring: "Ganged forming enabled us to place our concrete efficiently and vibrate properly, held bracing costs to a minimum, allowed us one pour every four working days and gave us some very low erection costs."

Complete story on the Ohio Sewage Treatment Plant will be sent FREE upon request. Symons Forms may be rented with purchase option.

Symons CLAMP & MFG. CO.

4255 DIVERSEY AVENUE DEPT. K-9 CHICAGO 39, ILLINOIS

Warehouses throughout the U.S.A.

MORE **SAVINGS** FROM **SYMONS**

—— Make a "spec check"...

Compare Haulpak ... see how

LW engineers "threw away the book" when they designed the new Haulpak off-road hauler... for *your* benefit. Some of the exclusive features that resulted are shown here. They are advantages that help you move *more* tonnage, *faster*, at *lower* net cost per ton.

To see what this advanced design approach means to Haulpak, check its specifications. You'll want "spec sheets" in your files anyway, and your LW Distributor can supply you copies. Then, with basic Haulpak facts handy, compare them to *other* off-road haulers.

WHAT YOU WILL FIND WHEN YOU COMPARE HAULPAK:

(Competitive hauler specifications are "averaged out" for simplicity purposes... but Haulpak superiority is just as clear over any *single* machine.)

WHAT TO COMPARE	Off-road Haulers 20-30-ton class		Off-road Haulers 30-40-ton class		HOW YOU BENEFIT
	Average*	Haulpak LW 27	Average*	Haulpak LW 32	
Length Wheelbase Turn Diameter	26'7" 14'4" 64'3"	23'10" 10'10" 44' 6"	31'5" 16'7" 77'6"	23'10" 10'10" 44' 6"	*HAULPAK is shorter.* You maneuver faster, quicker and in less space.
Top Speed (in mph)	30.7	35.4	25.2	38.8	*HAULPAK is faster,* for more cycles per hour, more tonnage per shift.
Empty Weight (in lb)	49,300	43,020	73,400	44,950	*HAULPAK is lighter,* for more payload weight, less "dead" weight.
Ground Clearance Front Axle Rear Axle	16" 16"	25" 20"	17¼" 18½"	25" 20"	*HAULPAK has higher clearance,* to minimize troublesome "dozing" action.
Brake Surface (sq inches)	1511	4680	1834	5148	*HAULPAK has bigger brakes,* for greater safety, more steady use of high speeds.

(*Based on specifications available at time of printing)

All new . . . but Haulpak is already a fully-proven piece of equipment. Units worked for over 14 months on construction jobs, in mines, and in quarries, before the first Haulpak was put on the market. Exceptional results of these tests are now being duplicated all around the nation.

it can cut your haul costs

Hydrair* suspension...eliminates springs...permits higher clearance, shorter turns

Haulpak rides on air! 4 Hydrair units replace leaf springs. System cushions against loading and travel shock, reduces maintenance costs. Eliminates front axle, and compensates for off-center load. *COMPARE IT!*

"V"-shaped body...lets Haulpak outcarry trucks that are longer, higher, heavier

Bonus yardage in every Haulpak load rides in exclusive V-bottom of body. Slope also helps fill all corners for low-void payloads. "V" lowers center of gravity for better stability, traction, on grades. *COMPARE IT!*

Box-beam frame...3 times stronger, ⅓ lighter, carries 30% more payload weight

Strongest hauler body ever built. Floor and all wear-surfaces made of 10,000 psi steel, yet weighs 33% less than comparable bodies. Body is exhaust-heated. Haulpak hauls 30% more than its own total weight. *COMPARE IT!*

Available in 22, 27, and 32-ton capacities

PLUS: MINIMUM MAINTENANCE (entire lube-check, needed only at 500-hr intervals, consists of just 4 easy-to-reach grease fittings) . . . POWER-TRANSFER DIFFERENTIAL (famed Tournapull® feature which automatically transfers power to wheel on best footing when going is rough) . . . POWER-MISER FAN (cools with 20 to 25 less hp drain) . . . 100% RUBBER-MOUNTED BODY (absorbs impact and shock of loading) . . . FOUR SEPARATE BRAKING SYSTEMS (for fast stops with complete safety) . . . POSITIVE POWER STEER (for faster turning, easier handling) . . . SIMPLE SIX-GEAR FINAL DRIVE (compared to 12 or more usually standard) . . . BIG, ROOMY CAB (has many work-efficiency features).

*Trademark HP-2193-DC-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

LW PHOTO REPORT

Big, high-production earthmoving fleet sets fast pace for Canonie Construction Co.

With a big fleet of LeTourneau-Westinghouse high-production earthmovers — consisting of 21 C Tournapulls® with 18-yd Fullpak® scrapers, 4 D Tournapulls with 9-yd scrapers, 2 Tournatractors®, and a 123-hp LW grader — Canonie Construction Co. of South Haven, Michigan, handles jobs from 50,000 to 5,000,000 yd with equal efficiency. And Canonie finds the flexibility and mobility of this fleet easily adaptable to the handling of a number of jobs at the same time.

On the job pictured — moving 650,000 yd of earth to rebuild 7.5 miles of Michigan Route 140 — Canonie worked all of his LW machines except 3 C Fullpaks, which were working on a building site in Kalamazoo.

Which size LW fleet is best for YOUR operation?

As you plan for future operations, it is worth your while to investigate the flexibility and overall economy of LW earthmoving equipment. These machines incorporate all of the latest engineering advantages developed over the years by LW engineers, and proved in thousands of hours of actual field operation. With an LW fleet you can be assured of top production, economy, and profit on *any* type of job. Tournapull scrapers are available in 9, 18, 20, and 28-yd capacities; 143 to 360 hp. Each fits specific job problems. You can have the right combination of machines to give you most for your money. We'd like to discuss with you the size machines best for YOUR fleet operation.

In rapid succession, Canonie's fast-moving C 'Pulls* dump loads of sticky clay to build bridge-approach. The positive-ejection tailgate on the LW scraper, has plenty of power to force out sticky clay, mud, rocks — wipes bowl clean in a single pass. Control of tailgate is by positive electric control.

Here, one of 21 C Tournapulls owned by Canonie Construction is push-loaded with sand, building 7.5 miles of Michigan State Route 140, between Covert and Watervliet. Says Mr. T. Canonie, President of the firm, "The low, wide Fullpak scraper-design *cuts seconds off loading time. In a couple of weeks, this adds up to a substantial amount of bonus yardage.* And we like 'Pulls electrical system . . . certainly makes it easy for our operators to control their units."

Small-yardage and clean-up jobs are handled fast and efficiently by Canonie's 4 LeTourneau-Westinghouse D Tournapull scrapers. Here, two of these 29.5-mph "Handymen" are shown self-loading sandy soil as they handle finish work on a Michigan road job. Only 8'-wide and within the 9-ton axle-load limit, D 'Pull can be driven from job-to-job via highway or city streets without permit.

One of two Tournatractors owned by Canonie Construction Co. backfills around a culvert on the 650,000-yd Michigan Route 140 project. Comments Mr. Canonie, "You can move this rubber-tired tractor from one location to another without the necessity of bringing in a low-boy trailer. As a matter of fact, we have a 2-way radio system in our LW tractors so we can move them around fast . . . without wasting time tracking 'em down.

"We think our Tournatractors are great for leveling *and compacting* fill," continues Mr. Canonie, "the rolling action of their big tires as they work across the fill gives us all the compaction we need. We hydroflate the tires to get added weight." (With tires hydroflated, Tournatractor itself provides bonus compaction, equivalent to an extra 20-ton roller.)

For the type of work done by Canonie Construction Co. the LW 550 is considered a sound grader investment. Here this 123-hp grader cuts trench for 6,600'-long tile line near Watervliet, Mich. Equipped with 8'-wide dozer blade, Canonie's versatile LW 550 handles backfilling and other light dozing jobs as well as regular grading assignments.

*Trademark CP-2067-DCJ-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

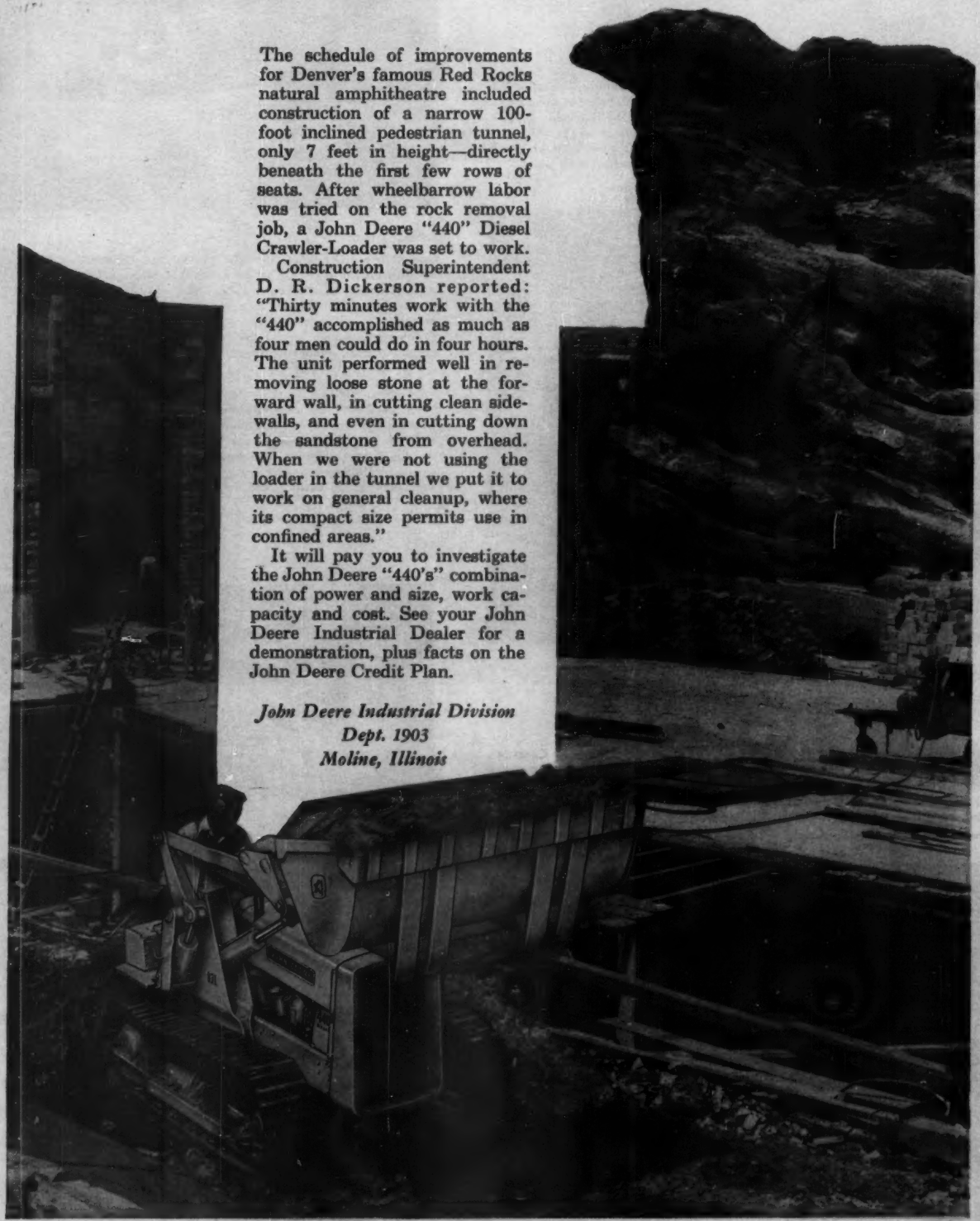
This John Deere Loader tunneled its way through 100 feet of red Colorado sandstone

The schedule of improvements for Denver's famous Red Rocks natural amphitheatre included construction of a narrow 100-foot inclined pedestrian tunnel, only 7 feet in height—directly beneath the first few rows of seats. After wheelbarrow labor was tried on the rock removal job, a John Deere "440" Diesel Crawler-Loader was set to work.

Construction Superintendent D. R. Dickerson reported: "Thirty minutes work with the "440" accomplished as much as four men could do in four hours. The unit performed well in removing loose stone at the forward wall, in cutting clean sidewalls, and even in cutting down the sandstone from overhead. When we were not using the loader in the tunnel we put it to work on general cleanup, where its compact size permits use in confined areas."

It will pay you to investigate the John Deere "440's" combination of power and size, work capacity and cost. See your John Deere Industrial Dealer for a demonstration, plus facts on the John Deere Credit Plan.

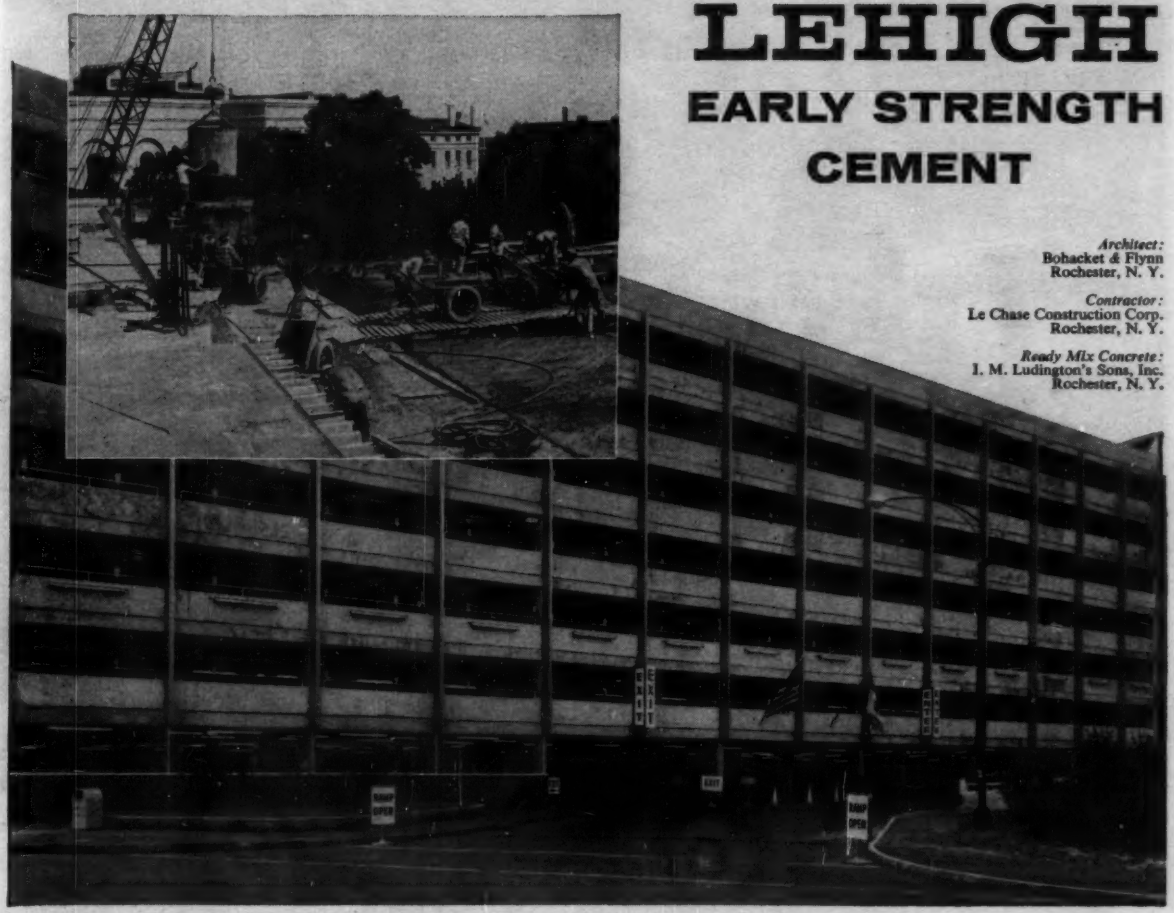
John Deere Industrial Division
Dept. 1903
Moline, Illinois



JOHN DEERE *"Specialists in Low-Cost Power with a Heavyweight Punch"*

Rochester adds another concrete parking ramp made with

LEHIGH
EARLY STRENGTH CEMENT



Architect:
Bohacket & Flynn
Rochester, N. Y.

Contractor:
Le Chase Construction Corp.
Rochester, N. Y.

Ready Mix Concrete:
I. M. Ludington's Sons, Inc.
Rochester, N. Y.

Eight parking levels contain 551 metered spaces. Motorists park their own cars, taking advantage of such modern features as automatic coin changers, passenger elevators and a counting system which tells them where spaces are available.

• *The Clinton Avenue Parking Ramp* is another structure resulting from the forward thinking of the City of Rochester, N. Y. Because of the ramp, 551 more cars have been removed from the curbs of busy downtown streets.

For the second time in 26 months (the city's 523 car Mortimer Street Parking Ramp was completed in March '58) Lehigh Early Strength Cement was chosen for a big Rochester parking facility. The tight schedule called for placement of concrete during most of the Fall and Winter months. Work progressed so well that six floors were opened temporarily during the Christmas rush. After the holidays, concrete pouring was completed. The ramp has been producing full income since April.

This is another example of how Lehigh Early Strength Cement saves time and money in modern concrete construction. Lehigh Portland Cement Company, Allentown, Pa.

LEHIGH CEMENTS

JAEGER 20′-26′ HYDRAULIC DUAL-SCREW SPREADER and SPREADER-FINISHER

. . . the 2 machines that head your non-stop paving team

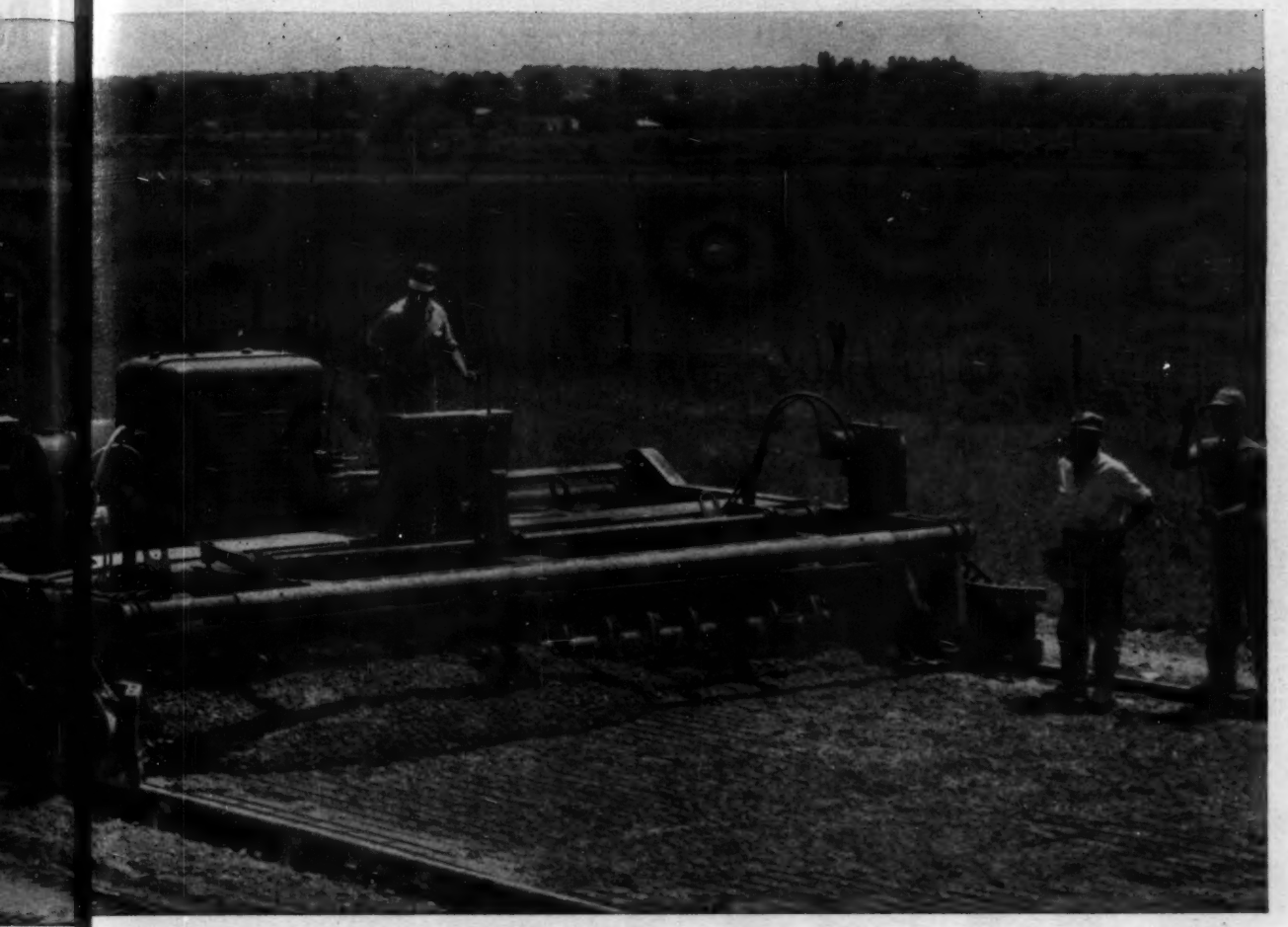
Now you can have the *hydraulic screw* spreader you've been waiting for, with or without finishing screed.

EASIEST TO OPERATE, FASTEST TO SPREAD: Operator merely "plays" hydraulic levers to control independent right and left hand spreading screws, speed them up, slow them down, reverse their rotation, and lift or lower. No other method gives such ease and accuracy of spreading, with capacity to handle largest paver production.

REMIXING BY SPREADING SCREW PRODUCES STRONGER SLAB: Paver batches are reworked and intermixed, densified in texture and compacted solidly against both subgrade and forms. No segregation, no honeycomb, as proved by hundreds of core tests in various states.

SCREED METERS MATERIAL TO FINISHER: When equipped with Jaeger 12″ screed, the Spreader is a Spreader-Finisher. It does everything a Spreader can do, plus making a precision strike-off of the top course, by oscillating screed, so as to meter exactly the right amount of material for the finishing machine.

When you use a Spreader-Finisher on top course, any excess or deficiency of material shows up when it is easiest to correct, and your finishing machine always works under ideal conditions.



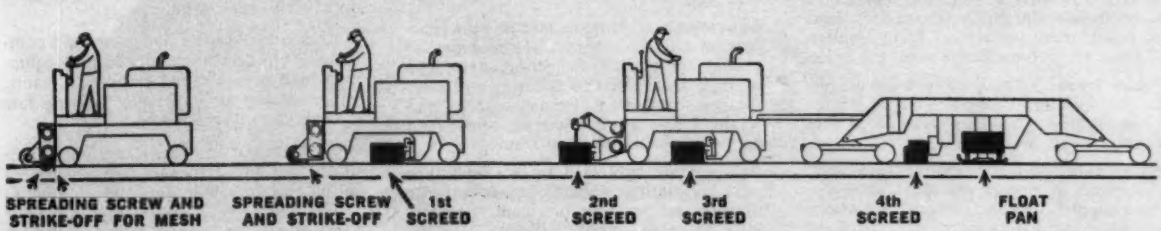
COMPLETE PAVING TEAM FOR TWO COURSE PAVEMENT

JAEGER SPREADER, with dual screws and strike-off, is vertically adjustable to as much as 7" below forms.

JAEGER SPREADER-FINISHER, with dual screws, strike-off and screed, lays top with accurately metered surface.

JAEGER FINISHER, with tandem screeds, does precision finishing job.

JAEGER FINISHER-FLOAT, with suspended hydraulic screed and drag float towed and operated from finisher, completes the finish, ready for burlap and cure.



2 MEN, 4 SCREEDS: On full depth pavement (no mesh required) the Jaeger Spreader-Finisher, Finisher and Finisher-Float, all on top course, give you a combination of spreading screw, strike-off, 4 screeds and a drag float, *with only 2 operators.* It equips you to do a perfect machine finishing job with minimum labor; it enables you to complete each day's run and knock off your finishing crew almost as early as your paver.

20' TO 26' TELESCOPIC WIDTH ADJUSTABILITY, easy wheel changes and choice of revolutionary new universal crown or gable crown screed and float pan, both with quick-crown-change, are Jaeger features. Get complete facts from your Jaeger distributor — or send for new Catalog DSP9. The Jaeger Machine Company, 800 Dublin Avenue, Columbus 16, Ohio. Jaeger Machine Company of Canada, Ltd., St. Thomas, Ontario.

JAEGER

Lima Austin-Western Model 4248 overhead eccentric roller bearing Jaw Crusher

LIMA A-W 42x48-in. Jaw Crusher produces more rock for less

Speed up crusher output with giant Lima Austin-Western 42 by 48-in. overhead eccentric roller bearing Jaw Crusher. Quality built to outperform! Oversized shafts and roller bearings for extra strength and durability. Extra-deep jaws of tough manganese steel form smaller, sharper and more efficient crushing angle.

main frame is practically unbreakable. Low alloy, high strength 3-in. steel plate gives frame tremendous strength in proportion to its weight.

flywheels are heavy castings, precision machined to proper balance. Split-type hubs simplify flywheel removal. Flywheels are key-locked into place, can't back off in operation.

pitman and shaft assembly can be easily removed through crusher frame top. Cartridge-type housing holds assembly in place, eliminates possibility of loose bearings.

bearings—Both main and pitman bearings are oversized and self-aligning to permit some shaft deflection, and deviation is minimized by locating the bearings close together. Frame absorbs part of shock load as main bearing center lines are within sides of main frame.

Bearings are protected by a simple-type steel labyrinth seal which resists entrance of dirt and seals in lubricant. Bearings may be easily removed by use of a hydraulic system furnished with this model.

capacity—What the Model 4248 can do for you may be seen from the fact that it handles 240-360 tons an hour when set at 5-in. discharge opening; estimate based on 2700 lb. per cu. yd.

Lima Austin-Western also produces a complete line of crushing and screening equipment and portable and stationary plants. Other smaller sizes of roller bearing Jaw Crushers are also available.

Profit from our 73 years' experience manufacturing Jaw Crushers and equipment for pit and quarry. Engineered and built to *produce more rock at less cost!* See your Lima Austin-Western distributor now or write us for free bulletin.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA AUSTIN-WESTERN Crushing, Screening and Washing Equipment

BALDWIN · LIMA · HAMILTON

CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO

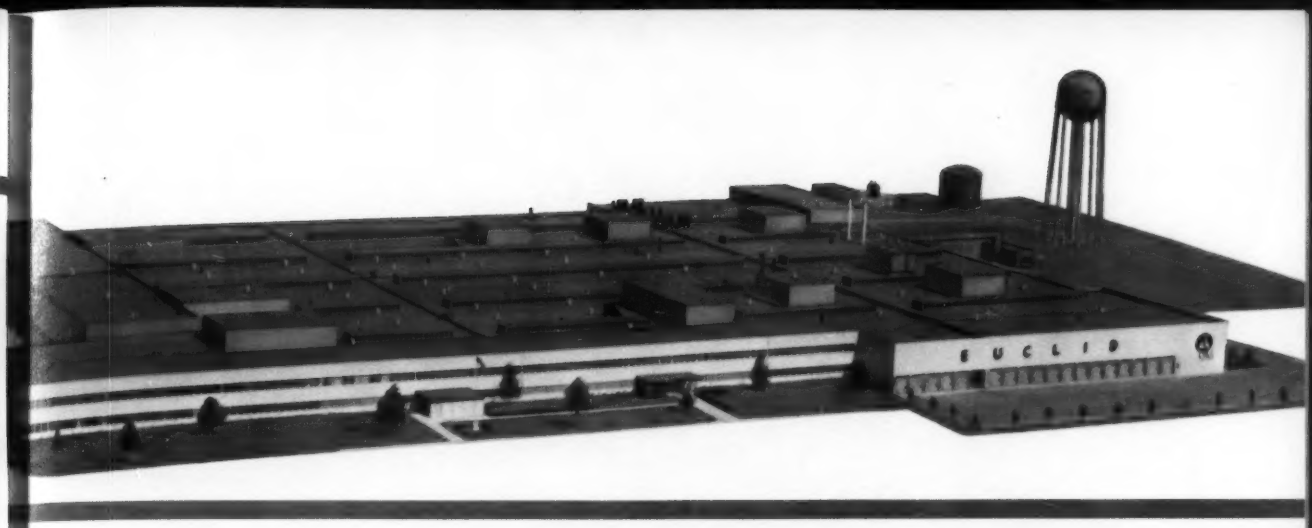
5928

BIG CRAWLER TRACTOR NEWS FROM EUCLID!

C-6 Crawler now in production at Euclid's new tractor plant

A new concept in crawler tractor design, the Model C-6 is the most recent addition to the modern line of Euclid equipment developed and job proved during the past 5 years. Like the big twin-power TC-12 tractor, as well as 5 new scraper models and 4 new rear-dump haulers, the C-6 has the power, speed and versatility to get more work done faster and at lowest cost. All of these new "Eucs" incorporate years ahead engineering that has been a major factor in maintaining Euclid's leading position in the construction equipment industry for many years.

Now a big modern plant at Hudson, Ohio, designed exclusively for the manufacture of Euclid crawlers, is in production on Model C-6 and TC-12 tractors. Here every facility is provided to assure a uniform high standard of product quality that pays off in dependable long life performance of Euclids on every job.



C-6 sets a new standard in 200 h.p. tractor class

Brand new in every way . . . in functional design, ease of operation, service accessibility and productive capacity . . . but a "veteran" of many thousands of operating hours on a wide range of actual jobs and thorough testing at the proving grounds. No other machine in Euclid's history has ever been so completely proved for productive capacity and long service life before the start of volume production.

With 211 net h.p. and job proved Torqmatic Drive, there's a smooth, steady flow of power to match the work load. Changes from any speed range to another and from forward to reverse and back again, are made under full power . . . there are 3 speed ranges in forward and reverse, with a top speed of 7.9 mph.

Dry type air cleaner, full hydraulic track tensioning, independently suspended track frames and final drives, rear mounted cooling system, fewer lube points, and "package" assembly of major components are some of the other C-6 features that make this "Euc" outstanding for easy servicing and maintenance.

Compare and prove for yourself...

THE "EUC" C-6 IS THE LONG-NEEDED "STEP AHEAD" IN CRAWLER DESIGN

When you check all the things that really count in crawler performance . . . easy operation, maneuverability, power and traction for tough work, and minimum downtime . . . you'll see why the new C-6 is your best investment in the 200 h.p. class. No matter what the job is . . . heavy dozing and ripping, push-loading big scrapers, pulling heavy loads, stripping, land clearing, or handling stockpile assignments . . . the versatile C-6 cuts costs and gets more work done faster.

The Euclid dealer in your area will be glad to show you why the C-6 is your best bet for increased production at lowest overall cost.

GM GENERAL MOTORS EUCLID

EUCLID DIVISION OF GENERAL MOTORS
Cleveland 17, Ohio

EUCLID (GREAT BRITAIN) LTD.
Lanarkshire, Scotland

. . . a complete line of equipment for heavy earthmoving, mining, logging and many industrial operations . . .

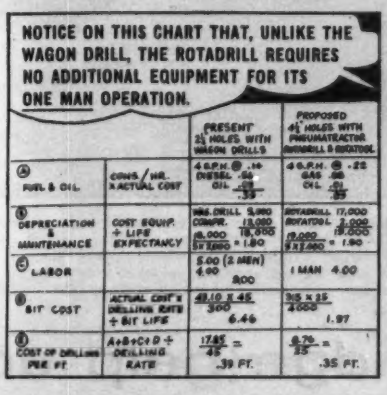
Printed in U.S.

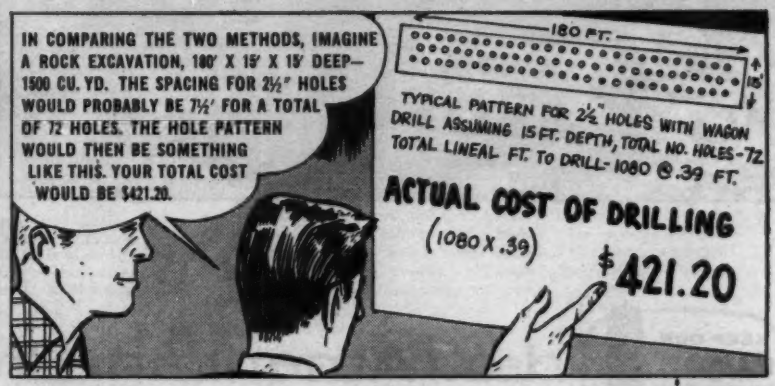
NEWEST, MOST MODERN DRILLING METHODS:

Save up to 2/3 on drilling costs!

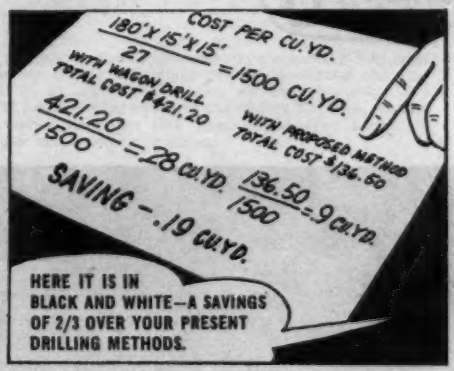
MR. WARD, LET ME TELL YOU ABOUT A NEW DRILLING TECHNIQUE THAT LETS YOU DRILL FASTER, CHEAPER AND BETTER THAN YOU DO WITH YOUR PRESENT METHODS.
J.T. WARD & SON
GENERAL CONTRACTORS

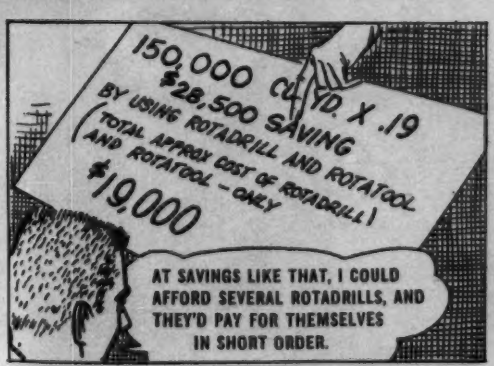
WITH THE SCHRAMM ROTADRILL, A COMPLETELY SELF-CONTAINED DRILL RIG AND 125 CFM COMPRESSOR, YOU DRILL LARGER, FEWER, 4½" HOLES AT ONLY 35 CENTS PER FOOT.




IN COMPARING THE TWO METHODS, IMAGINE A ROCK EXCAVATION, 180' X 15' X 15' DEEP—1500 CU. YD. THE SPACING FOR 2½" HOLES WOULD PROBABLY BE 7½' FOR A TOTAL OF 72 HOLES. THE HOLE PATTERN WOULD THEN BE SOMETHING LIKE THIS. YOUR TOTAL COST WOULD BE $421.20.
180 FT.
15'
TYPICAL PATTERN FOR 2½" HOLES WITH WAGON DRILL ASSUMING 15 FT. DEPTH, TOTAL NO. HOLES-72 TOTAL LINEAL FT. TO DRILL-1080 @ .39 FT.
ACTUAL COST OF DRILLING
(1080 X .39)
$421.20

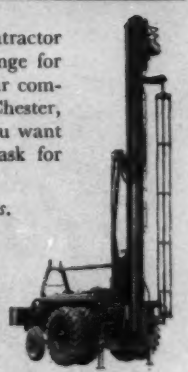
WITH 4½" HOLES, THE SHOT PATTERN WOULD REQUIRE 13½' SPACING AND WOULD CONSIST OF ONLY 26 HOLES FOR THE SAME EXCAVATION AT A TOTAL COST OF $136.50—A SAVING OF $284.70.
180 FT.
15
TYPICAL PATTERN FOR 4½" HOLES WITH ROTADRILL AND ROTATOOL -TOTAL HOLES- 26 AGAIN ASSUMING 15 FT. DEPTH, TOTAL LINEAL FEET- 390 @ .35 FT.
ACTUAL COST OF DRILLING
$136.50
HERE ARE THE FIGURES.
SAVING $284.70


COST PER CU. YD.
180'X 15'X 15' / 27 = 1500 CU. YD.
WITH WAGON DRILL TOTAL COST $421.20
421.20 / 1500 = .28 CU. YD.
WITH PROPOSED METHOD TOTAL COST $136.50
136.50 / 1500 = .9 CU. YD.
SAVING - .19 CU. YD.
HERE IT IS IN BLACK AND WHITE—A SAVINGS OF 2/3 OVER YOUR PRESENT DRILLING METHODS.


150,000 CU. YD. X .19
$28,500 SAVING
BY USING ROTADRILL AND ROTATOOL
(TOTAL APPROX COST OF ROTADRILL AND ROTATOOL - ONLY
$19,000
AT SAVINGS LIKE THAT, I COULD AFFORD SEVERAL ROTADRILLS, AND THEY'D PAY FOR THEMSELVES IN SHORT ORDER.

Want to see more? Let us show you the Pneumatractor Mounted Rotadrill in action! Act now to arrange for your own personal demonstration. Write on your company letterhead to SCHRAMM, INC., West Chester, Pa., and we'll set up a date with you. Or, if you want more information before your demonstration, ask for Bulletin DM58-4.

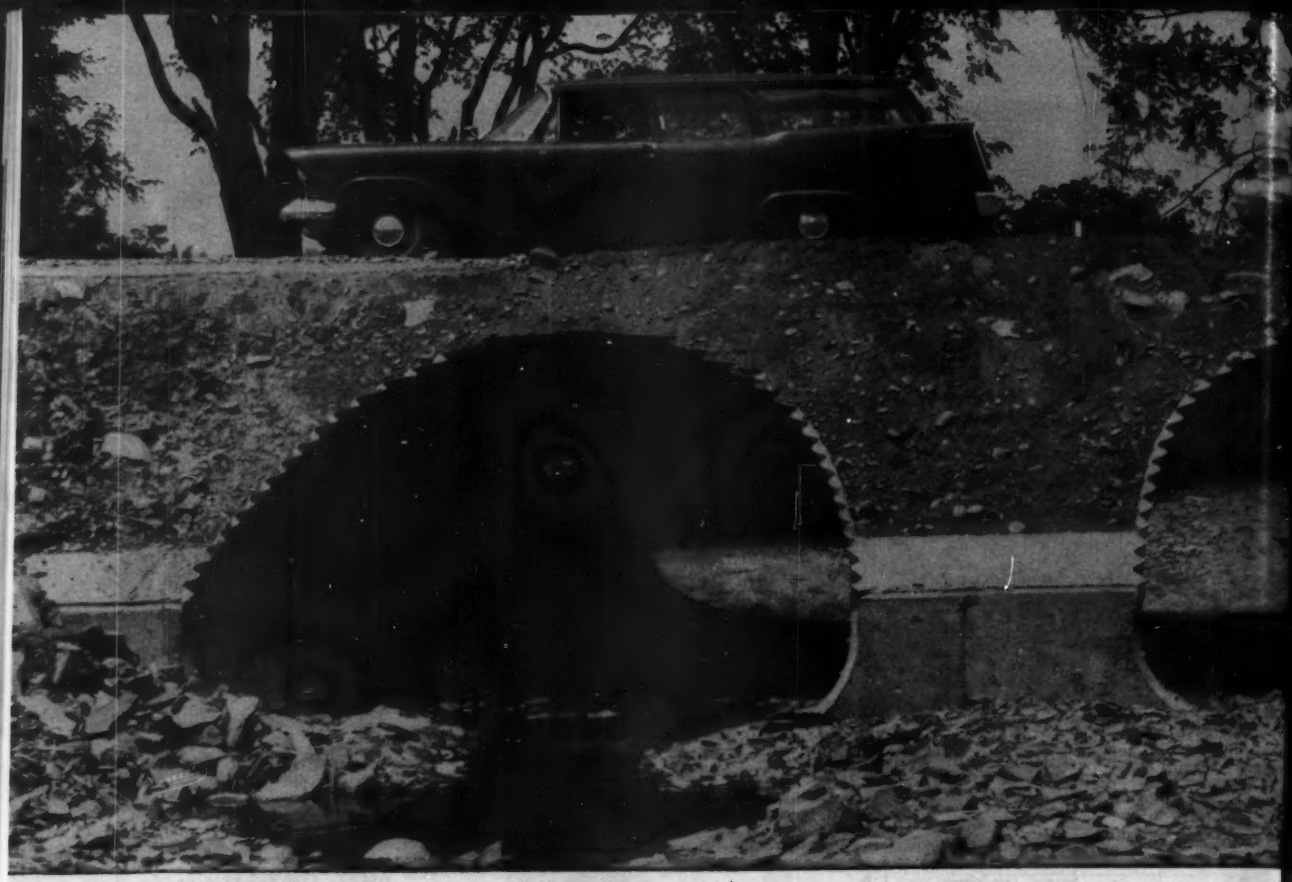
Your local Schramm dealer is listed in the Yellow Pages.



Schramm, Inc.

MANUFACTURERS OF AIR COMPRESSORS

604 North Garfield Ave. • West Chester, Pa.



KEEP OUR ROADS ON THE GO

Let American Bridge help do he

USS AmBridge Highway Beam Guardrail and Posts provide the sure traffic safeguard available. The rugged, flexible and highly visible ste beam guardrail is easily and firmly bolted to quickly driven steel post Available in 25' lengths to minimize splicing.

S AmBridge Sectional Plate pipe, pipe-arches and arches eliminate the
d for forms. And, being made of steel, there is no breakage. They are
ced quickly, and can be extended whenever the road or fill is widened.
y are extremely durable, and they can be relocated if necessary.
Bridge Sectional Plate comes in a complete range of standard sizes.

There's nothing easy about building a road, especially where there is an obstacle to span—or drainage to accommodate. Fortunately, however, you can throw these tough jobs to an outfit that specializes in handling them: American Bridge.

Wherever man or nature has created a space barrier, American Bridge can build a bridge of any length to span it—or we can re-floor an old bridge to support more weight . . . without stopping traffic. If the problem is a meandering creek, it can be funneled through an American Bridge drainage structure, which can be placed in days and will last for years. On the finished road itself, American Bridge can supply the strongest, simplest, *safest* guardrail on the market.

All AmBridge highway products are made from steel, and are manufactured to long-established, dependable standards. They can be placed quickly and simply—without kid-glove handling. Contact any office for information, or write to Pittsburgh for literature on sectional plate, bridge flooring or guardrail literature.

USS and I-Beam-Lok are registered trademarks

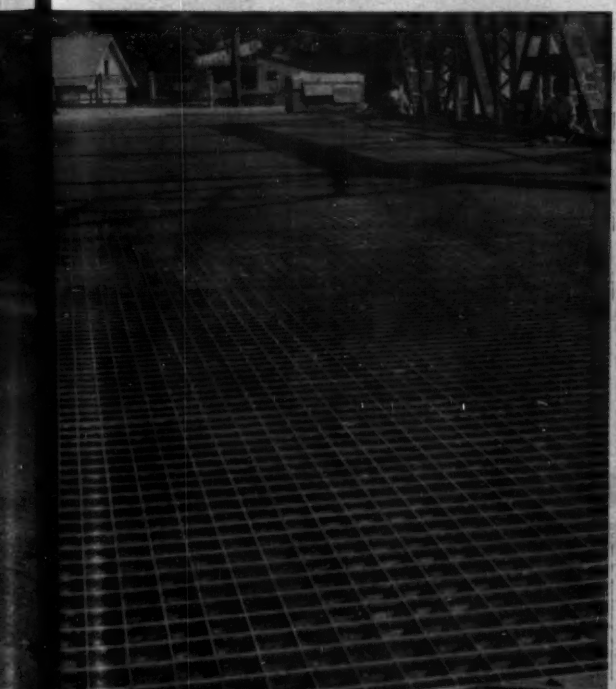
USS American Bridge Division of United States Steel

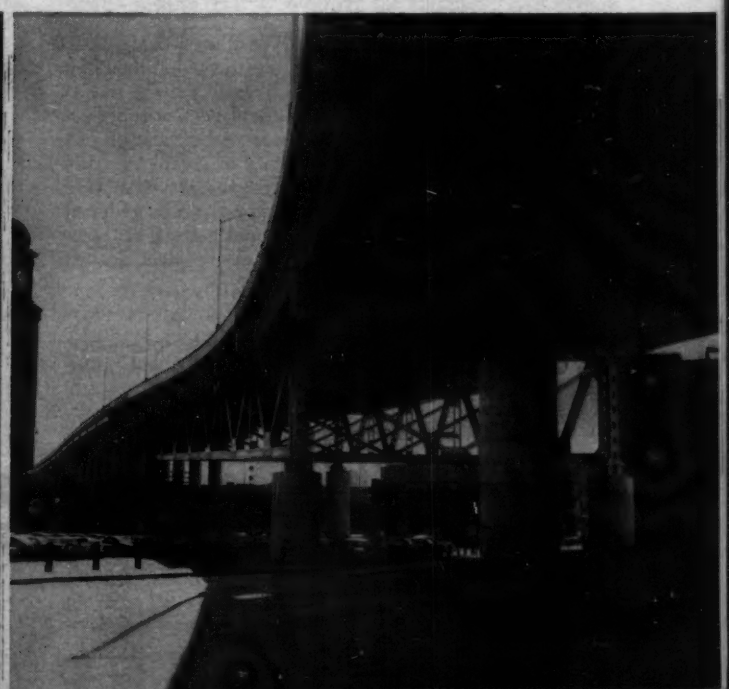
General Offices: 525 William Penn Place, Pittsburgh, Pa.
Contracting Offices in: Ambridge • Atlanta • Baltimore • Birmingham
Boston • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit
Elmira • Gary • Harrisburg, Pa. • Houston • Los Angeles • Memphis
Minneapolis • New York • Orange, Texas • Philadelphia • Pittsburgh
Portland, Oregon • Roanoke • St. Louis • San Francisco • Trenton
United States Steel Export Company, New York

he toughest part of your roadwork

S AmBridge I-Beam-Lok—the sturdy, lightweight, long-life bridge
ring for modern traffic—saves money on erection and maintenance.
sure e and speed of installation minimizes traffic interruptions. Filled-
e ste e shown below, before pouring concrete, is available in units 6' wide
post up to 49' long. They can be applied directly to stringers on spans
n 6' up to 8' centers. Open type also available for spans up to 4' long.

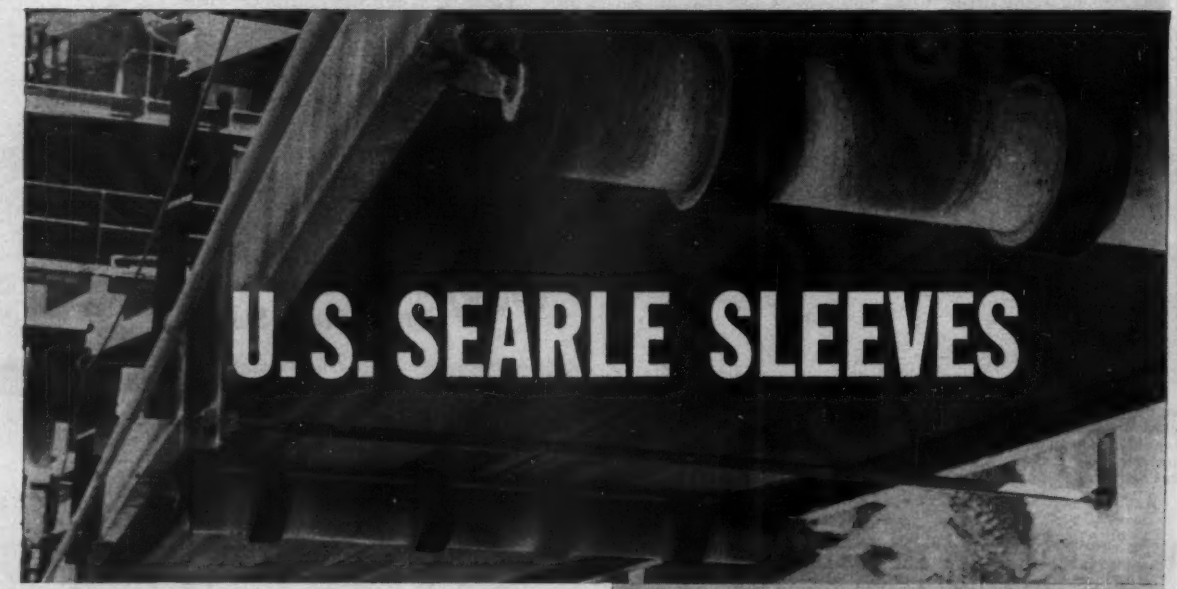
Steel is basic for bridges. And nobody knows more about building steel bridges than American Bridge; specialists in steel fabrication and construction since 1900. In nearly sixty years, we have handled every conceivable type of job. From big ones like the mighty Mackinac Bridge, and the new Carquinez span (the first major shop-welded bridge) to thousands of simpler and shorter structures.





SEARLE SLEEVES

The patented proven way to prolong conveyor belt life!



One excavating contractor moved 4,000 tons an hour after mud build-up was about to close down conveyor system

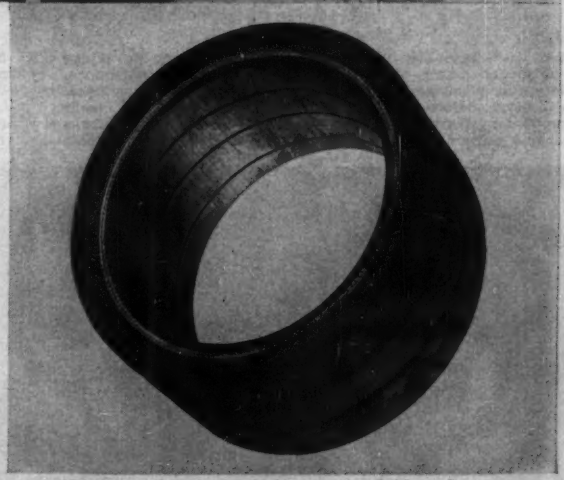
The patented Searle Sleeves are made of abrasion-resistant cushion rubber reinforced by heavy belt duck. Installation is fast, just slip them over the idler rolls. At impact points, cementing is recommended.

Says a customer in California: "We started using U. S. Searle Sleeves as impact idlers at a transfer point, handling primary crushed rock. The Searle Sleeves protect the 4" conveyor rolls from impact abrasion. Replacement is not yet necessary. The Searle Sleeves appear to be wear-proof."

Mud and sand build-up is minimized or completely prevented on idlers equipped with U. S. Searle Sleeves. Return idlers remain clean. Absence of build-up means reduced edgewear, prevents abrasion of idlers and belts. Belt "wandering" is eliminated. Searle Sleeves also protect against impact at loading points.

• • •

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.



Close-up of U. S. Searle Sleeve. Available in large variety of sizes to fit conventional conveyor idlers.

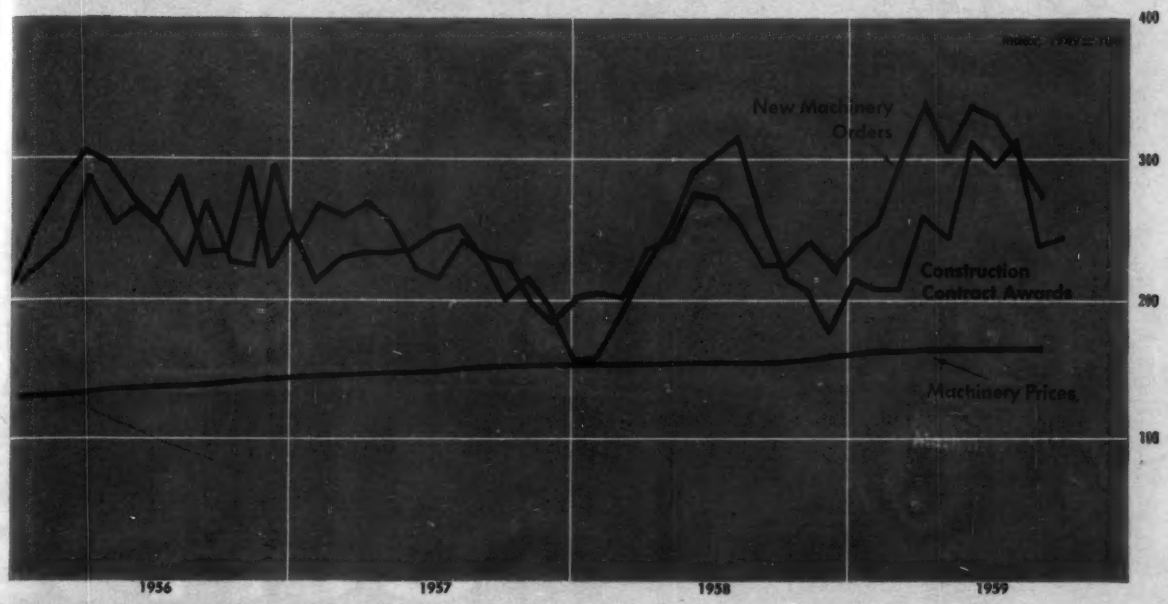
Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

Trends in the Machinery Market



Price Index

	AUGUST 1959	MONTH AGO	YEAR AGO	% CHANGE 1958-1959
All Types of Equipment	172.2	172.0*	165.5	+ 4.0
Cranes; Draglines, Shovels	**169.2**	**168.8**	**163.8**	**+ 3.3**
Shovel, ½ cu yd	163.3	163.3	154.0	+ 6.0
Shovel, ¾ cu yd	172.5	172.5	167.7	+ 2.9
Shovel, 1-1½ cu yd	181.9	181.9	178.4	+ 2.0
Shovel, 2-2½ cu yd	162.1	162.1	154.4	+ 5.0
Shovel, 3-3½ cu yd	167.8	167.8	162.7	+ 3.0
Shovel, 6 cu yd	195.0	190.5*	180.7	+ 7.9
Crane, truck mounted	166.2	165.7	164.2	+ 1.2
Crane, tractor mounted	135.1	135.1	135.1	0
Bucket, clam shell	157.5	157.5	152.7	+ 3.1
Bucket, dragline	169.3	169.3	180.8	— 6.4
Scrapers and Graders	**165.7**	**165.7**	**158.8**	**+ 4.3**
Scraper, 4 Wheel, 8-10.5 cu yd	155.0	155.0	155.0	0
Scraper, 4 Wheel, 12-15 cu yd	156.8	156.8	151.3	+ 3.6
Scraper, 2 Wheel, 15-19.5 cu yd (a)	123.7	123.7	122.7	+ 0.8
Grader, heavy duty	172.6	172.6	164.0	+ 5.2
Grader, light & medium	171.1	171.1	161.2	+ 6.1
Tractors (non-farm, incl industrial)	**187.8**	**187.8***	**180.5**	**+ 4.0**
Wheel-type, off highway (a)	128.2	128.2	128.4	— 0.2
Crawler-type, 50-74 dhp	191.9	191.9	182.7	+ 5.0
75-99 dhp	196.4	196.4	185.8	+ 5.7
100-154 dhp	191.3	191.3	186.7	+ 2.5
155-180 dhp	201.3	201.3*	191.8	+ 5.0
Machinery, Tractor Mounted	**188.6**	**188.6**	**181.7**	**+ 4.3**
Dozer, cable controlled	154.4	154.4	151.6	+ 1.8
Dozer, hydraulic controlled	186.6	186.6	177.3	+ 5.2
Cable power control unit	151.4	151.4	147.9	+ 2.4
Loader, shovel type	161.5	161.5	153.9	+ 4.9
Specialized Machinery	**157.0**	**155.7***	**150.7**	**+ 4.1**
Ditcher	156.6	156.6	154.1	+ 1.6
Roller, tandem	220.2	209.8	193.2	+14.0
Roller, 3 wheel	174.9	174.9	161.6	+ 8.2
Ripper and rooter	150.5	150.5	143.3	+ 5.0
Dewatering pump, 10 M gph	110.0	110.0	111.7	— 1.5
Dewatering pump, 90 M gph	150.5	150.5	144.3	+ 4.3
Portable Air Compressors	**167.5**	**167.5**	**159.1**	**+ 5.3**
Contractor's Air Tools	**181.6**	**181.6**	**164.6**	**+10.3**
Mixers, Pavers, Spreaders	**156.2**	**156.1***	**150.1**	**+ 4.1**
Mixer, portable, 11 cu ft	165.9	165.0	160.1	+ 3.6
Mixer, portable, 16 cu ft	171.0	168.9	163.7	+ 4.5
Mixer, truck, 6 cu yd	132.4	132.4	132.4	0
Mixer, paving, 34 cu ft	193.5	193.5	185.2	+ 4.5
Concrete finisher & spreader	190.4	190.4	181.5	+ 4.9
Bituminous distributor	122.3	122.3	122.4	— 0.1
Bituminous spreader	170.2	170.2	160.3	+ 6.4
Bituminous paver	159.3	159.3*	153.0	+ 4.1
Off-Highway Trucks, Wagons (b)	**101.1**	**101.1**	**99.9**	**+ 1.2**
Contractors off-highway truck (b)	101.1	101.1	99.9	+ 1.2
Trailer dump wagon (b)	101.4	101.4	100.0	+ 1.4

• a January, 1955=100 • January, 1958=100 *Revised
BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-49=100

Orders For Machines Fall Off Slightly

Construction contractors cut back orders for new equipment in August as their new business dropped.

The August index of new orders received by manufacturers of construction and mining machines fell to 270, based on average monthly volume in 1949 as 100. This was 18% off the near-record pace of July. But it was still 21% better than a year ago and very close to 1956's August record of 271.

Order volume for the first eight months set a record despite the slowdown in August. The orders index averaged 309 per month, which is 29% higher than in 1958 and tops the previous eight-months high in 1956 by 22%.

The new orders index is computed by the McGraw-Hill Economics Department, based on reports from a sample of companies in the industry.

Private Contracts Rise

The roaring comeback of private heavy construction is a major factor in the record demand for new construction equipment. Private contracts reported by *Construction Methods* have been rising while public works contracts have been on the downgrade. In fact, private awards volume pulled ahead of total public awards at the end of September.

This is the first time since the industrial building boom of 1956 that private volume has exceeded public works.

The slide in highway awards, which started in July and accelerated in August, has been the major factor in the public works drop. At the end of September, highway contracts were 15% under the record nine-months total of 1958, and total public works volume was off 11%.

Giant n Series E

New power! New design! New features! Plus a new drive option—Cat power shift transmission! The result: higher production on any application!

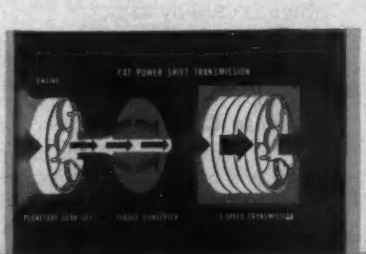
Now the "King of the Crawlers" is better than ever with new pace-setting capacity for higher, faster, lower-cost production on *any* big tractor application!

The biggest "new look" in the giant D9 Series E is the undercarriage. It's more massive . . . more rugged than ever. It'll add hours of life to running gear on even the toughest jobs. *Every* track component is new in design, highlighted by a big, new link—its pitch is increased 1¼" to 10¼"! And a new Caterpillar-developed steel alloy strengthens links, shoes, rollers *up to 40%!*

That's not all: the new D9 packs more power—335 HP. Its new equalizer bar gives greater stability on any terrain for greater operator confidence and production. A wider seat with a new spring-loaded adjustment mechanism makes the operator more comfortable, more efficient. No detail has been overlooked to make the new D9 handle heavier loads faster—and at lower operating and maintenance costs than ever.

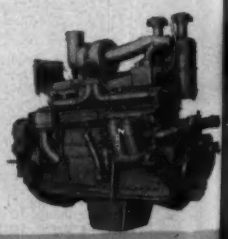
And that's not all. Now, along with direct drive and torque converter, you have your choice of the new Cat

Dry-type air cleaner. Removes at least 99.6% of all dirt from intake air during every service hour. Can be serviced in 5 minutes. Reduces maintenance time and cost.



Exclusive feature. A planetary gear set splits the power from the engine. Part goes directly to the 3-speed transmission, the rest goes through a torque converter to transmission.

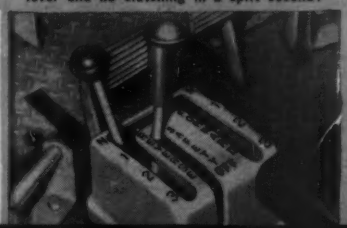
New sprocket. Sprocket is strengthened by new design with increased tooth thickness. Hunting tooth action provides slower wear rate.



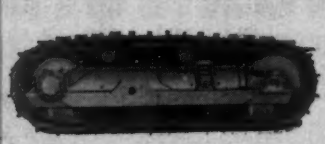
New 335 HP. More powerful than ever, the D9's Turbocharged Engine has the capacity to handle bigger loads faster, with dependability, economy.

New Turbocharger. New, compact turbocharger packs more air into the engine. Open impeller wheel (shown below) helps prevent dirt build-up.

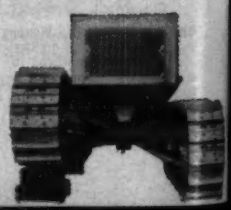
New power shift transmission. Optional on the D9. With this development you can shift on-the-go under full load with one lever and no clutching in a split second!



New, bigger, more rugged undercarriage. Major improvements in all track components add hundreds of hours of life to running gear—hours that mean more time on the job.



New equalizer bar. Greater stability. The rocking action of the bar shifts more weight to the up-hill track.



t new CAT D9
s E Tractor

power shift transmission. This revolutionary transmission, tested under the most rugged conditions, combines for the *first* time the positive feel of direct drive with the flexibility and anti-stall features of torque converter. With one control lever and no clutching, it reverses direction . . . changes speed . . . smoothly . . . under full load . . . in a split second!

Many of the new features, along with some familiar retained features, are shown here. Look them over. They'll give you an idea *why* the new D9 can mean higher production and more profits for you. For complete facts, see your Caterpillar Dealer. Ask for a demonstration and watch this giant eat up the work!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR'S **No. 1** PROJECT

CATERPILLAR'S NUMBER ONE PROJECT A multimillion-dollar research and development program — to meet the continuing challenge of the greatest construction era in history with the most productive earthmoving machines ever developed.

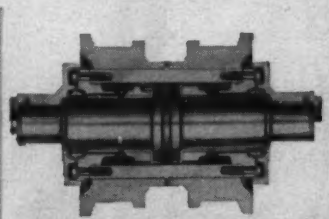
CATERPILLAR

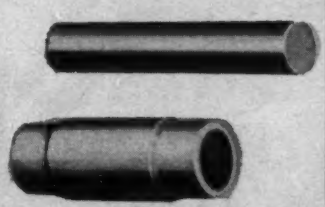
Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

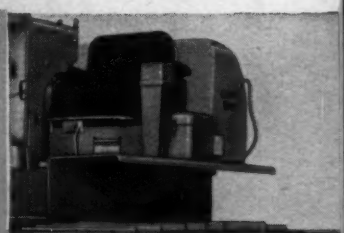
NEW D9 SERIES E— BORN OF RESEARCH PROVED IN THE FIELD

New track link — Previous track link

Light area at top indicates depth of hardening







New deep hardening steel. Caterpillar-developed steel alloy (plus more steel in stress areas) gives up to 40% longer life to track shoes, links and rollers.

Lifetime lubricated track rollers. Lifetime lubrication eliminates servicing problems. Oil is retained by dirt-proof, floating-ring seals.

Larger pins and bushings. Diameters are ¾" larger. Increased size reduces deflection and provides better contact along the length of the wear surfaces.

New seat adjustment. New spring-loaded adjustment mechanism provides more positive cushion and back rest positioning. Wider seat for more comfort.

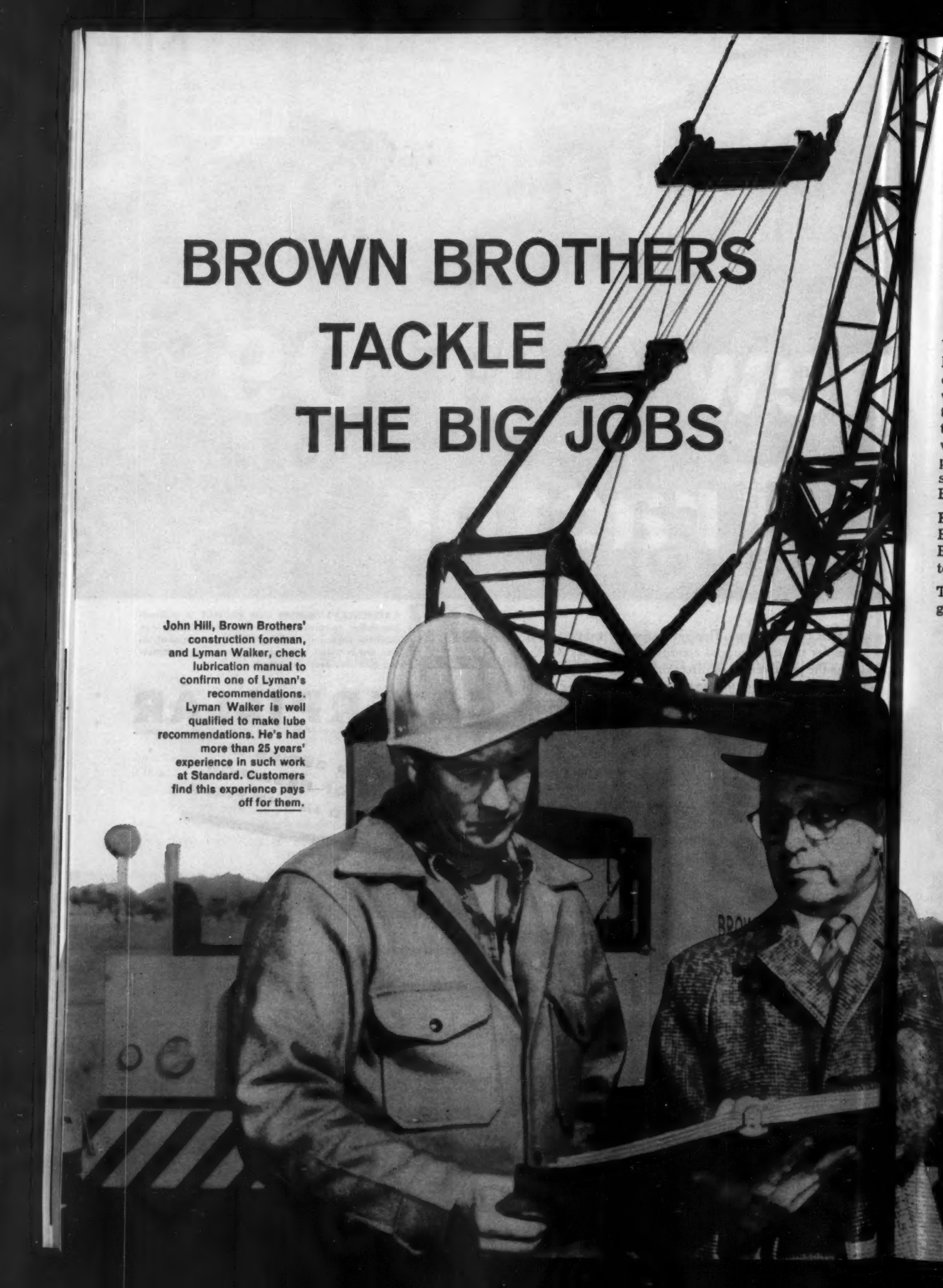
Better visibility. Redesigned fuel tank gives better visibility to the rear and tapered hood offers unexcelled forward vision.

Stronger track shoes. New alloy permits deeper hardening in wear areas. Grouser height is increased ¾" for better penetration and prolonged service life.

New foot decelerator. Provides easier machine positioning. Allows deceleration without taking hands from controls (optional on direct drive, standard on others).

Bigger, heavier track links. Strength has been added in stress areas. Pitch increase from 9" to 10¼" strengthens all track components.

BROWN BROTHERS TACKLE THE BIG JOBS



John Hill, Brown Brothers' construction foreman, and Lyman Walker, check lubrication manual to confirm one of Lyman's recommendations. Lyman Walker is well qualified to make lube recommendations. He's had more than 25 years' experience in such work at Standard. Customers find this experience pays off for them.

STANOLUBE Motor Oils and Standard Oil technical service keep equipment on the move

When Brown Brothers Construction Company, Lansing, Michigan, tackles a job, they have the equipment to do the work. Likewise, they have what's needed to maintain equipment on the toughest jobs. They use Standard Oil products and technical service. To move equipment on highways, the contractor employs a 60-ton trailer unit powered by a 300 hp GM diesel, one of the largest such units in service in Michigan. For moving dirt, Brown Brothers use Twin-Power Euclid Scrapers.

For lubrication of all of its equipment, Brown Brothers relies on STANOLUBE Motor Oils. Why? Because these motor oils are especially formulated to take the heavy duty service imposed on them.

The technical service needed to see that equipment gets the lubrication required is provided by Standard Oil lubrication specialist Lyman Walker. Lyman has more than 25 years' experience helping customers keep equipment in service and eliminating down-time due to lubrication failure.

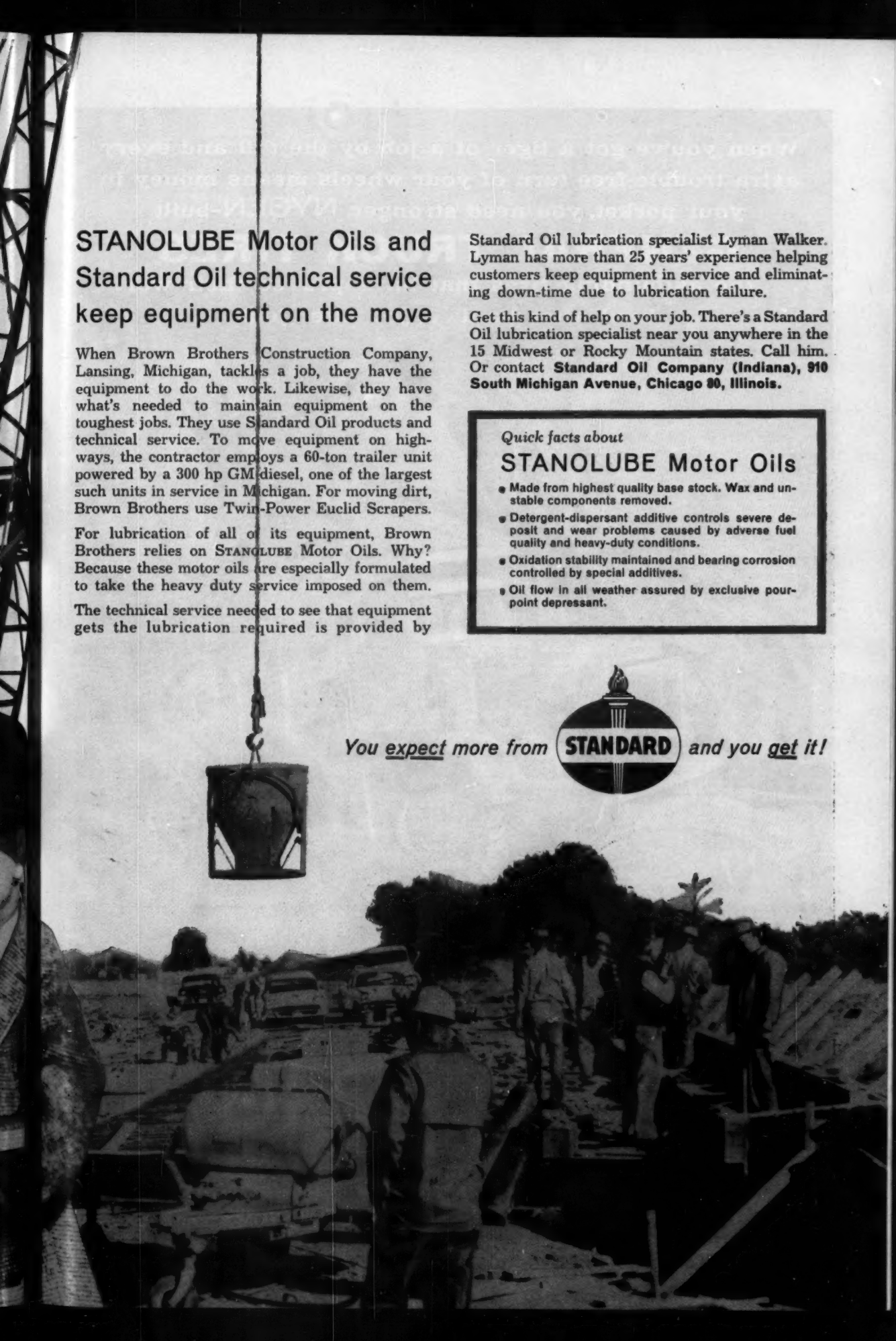
Get this kind of help on your job. There's a Standard Oil lubrication specialist near you anywhere in the 15 Midwest or Rocky Mountain states. Call him. Or contact **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

Quick facts about

STANOLUBE Motor Oils

- Made from highest quality base stock. Wax and unstable components removed.
- Detergent-dispersant additive controls severe deposit and wear problems caused by adverse fuel quality and heavy-duty conditions.
- Oxidation stability maintained and bearing corrosion controlled by special additives.
- Oil flow in all weather assured by exclusive pour-point depressant.

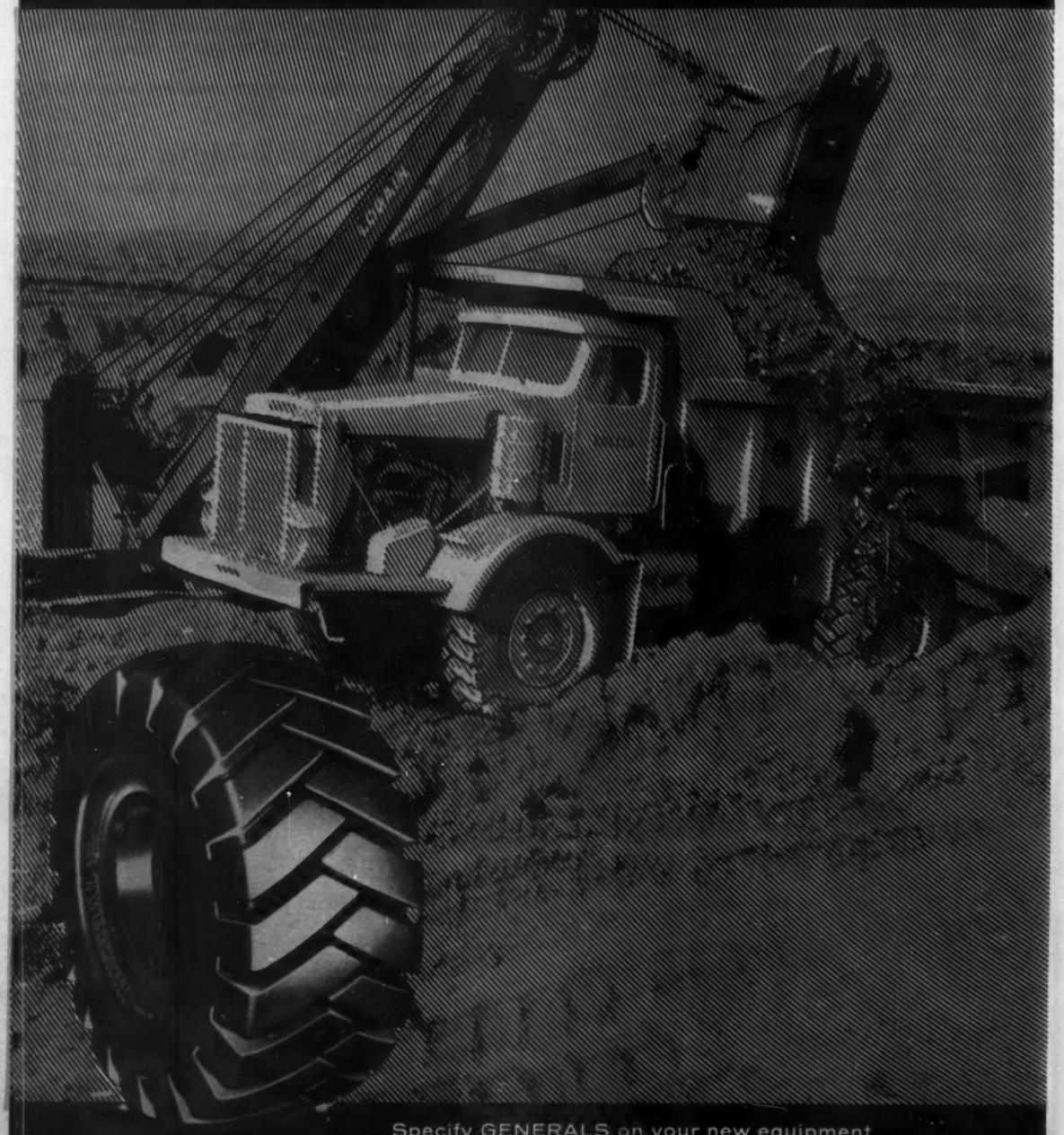
You expect more from **STANDARD** *and you get it!*



When you've got a tiger of a job by the tail and every extra trouble-free turn of your wheels means money in your pocket, you need stronger, NYGEN-built

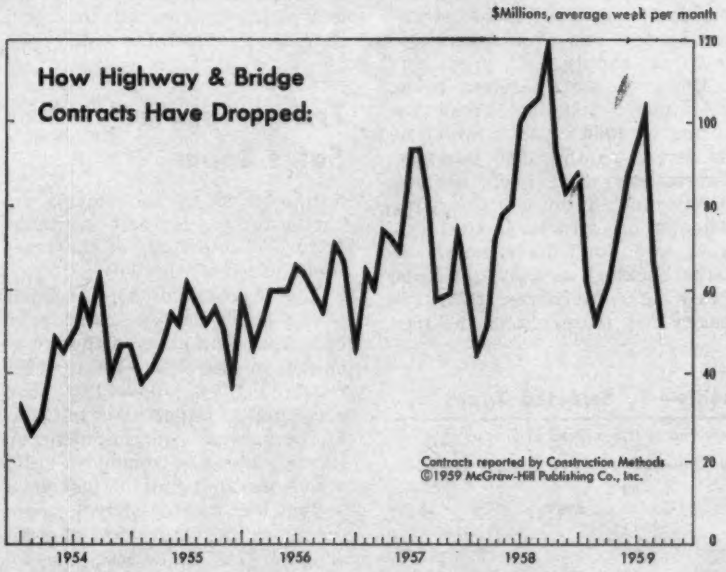
GENERAL TRUCK TIRES

. . . the astounding tires that have proved their worth haul after haul . . . job after job!



Specify GENERALS on your new equipment

THE GENERAL TIRE & RUBBER COMPANY, AKRON, OHIO



States Resume Road Bid Calls This Month

BIGGEST QUESTION for highway contractors now is: How soon will state highway departments resume letting interstate highway and bridge construction contracts in volume.

For many states, the answer is: This month. A few states resumed advertising for bids on interstate jobs late in September; some may not resume "normal" lettings until November or later. Altogether, 41 state highway departments halted interstate highway contracts this summer, according to Fred Quinnel, Jr., president of the Western Association of State Highway Officials and Montana State Highway Engineer. Among the top road-building states that continued to let awards was California.

Among the first to resume interstate contracting were Minnesota and Wisconsin; they advertised for bids late last month. Two other major roadbuilding states, New York and Pennsylvania, are calling for bids this month on a large volume of work. New York has a $39-million bid opening for October 15: it includes two major interstate projects estimated to cost $7.1 million and $8.7 million. Pennsylvania will advertise $35-million worth of projects this month. And between November 1 and February 1, Pennsylvania will call for bids on an additional $100 million in federal-aid highways.

Virginia took bids October 14 on 12 projects. Tennessee may take longer to get its interstate highway contracting program in gear. Gov. Buford Ellington announced last month that the state "should be able to resume letting of contracts by November."

How Will It Compare?

Will the volume of highway and bridge awards come close to matching the pace set before the cutback in awards this summer. Probably not, for two reasons:

- All states get a 28% cut in their interstate highway construction allocations for fiscal 1961. The total federal money allocated is $1.8 billion, compared with $2.5 billion, the total originally authorized for fiscal 1961 and allocated for fiscal 1960. This means a particularly sharp cutback in those states that receive a smaller share of the total for fiscal 1960 and 1961 (under the new formula for allocating federal funds) and that have already obligated much of their fiscal 1960 allocations.
- The Bureau of Public Roads is going to control the rate at which state highway departments obligate interstate funds. The purpose is to match the flow of money out of the Highway Trust Fund to the flow of revenues into the fund. This will probably have the effect of slowing the comeback in highway and bridge awards. It will keep some states from obligating their allocations well in advance.

1959 Awards Down 15%

The cutback in interstate highway awards in July, August, and September had a serious effect on the over-all highway and bridge market, even though interstate projects account for less than half of the total.

September awards fell to the lowest monthly rate since the temporary slump early in 1958. The $51.7-million average per week in September, based on *CONSTRUCTION METHODS* contract award reports, was less than half the record $120 million per week in September, 1958.

Excluding bridge contracts, which were pushed up in July by the huge $126-million Chesepeake Bay Bridge-Tunnel contract, highway contracts dropped in each of the last three months. Highway awards alone averaged only $43.5 million in September, the lowest in 19 months.

This pulled the nine-months total of highway awards 15% below last year's record to $2,311 million (excluding bridges). The bridge total is 7% ahead of 1958 for the first nine months of this year, but the margin of increase is shrinking.

Highway awards fell steadily each week in September, but the downtrend will reverse this month. Awards during the last three months of 1959 should move up strongly, but probably will not match the year-ago pace.

Construction Methods forecasts that total 1959 highway contracts will fall 12% below 1958's all-time high.

continued on next page

Steel Shortage Looms

As if highway contractors didn't have enough troubles gearing their operations for a thinner and more competitive highway market, the prolonged steel strike threatens to create a structural steel shortage late this year and in the first few months of 1960.

Reinforcing bars also may be tight, though imports can help to ease the situation.

A steel shortage would upset contracting schedules because of a stretch-out in deliveries of structural steel. Bridge builders will be competing with industrial builders for fabricated structurals, and this could aggravate the tight supply.

However, this problem probably won't last later than the spring of 1960. And it won't be as severe as the 1956 shortage. Fabricators have been keeping pretty much abreast of the rising demand for structural steel this year and don't have nearly as large backlogs as they did three years ago. Moreover, their capacity has increased in the past three years so they will be able to fabricate on close to normal delivery schedules all the steel they can get from the mills.

Construction Equipment Shipments—By Selected Types

Number shipped by manufacturers, as reported to U.S. Bureau of Census

Type of Equipment	Quarterly Shipments 1959 Q2	Q1	% Chg. Q1-Q2	First Six Months 1959	1958	% Chg. '58-'59
Tractors						
Crawler, 50-74 dhp	1,386	1,020	+ 36	2,406	2,415*	— 0.4
75-99 dhp	1,570	950	+ 65	2,520	1,817*	+ 39
100-154 dhp	1,423	941	+ 51	2,364	2,387*	— 1
155 & up dhp	1,839	1,287	+ 43	3,126	2,063*	+ 52
Wheel, under 170 hp	261	93	+181	354	341	+ 4
170-249 hp	284	187	+ 52	471	672	— 30
250 hp & up	980	612	+ 60	1,592	1,071	+ 49
Off-Highway Trucks						
under 16 tons	151	95	+ 59	246	512	— 52
16 tons up	689	461	+ 49	1,150	501	+130
Trailers, wagons	152	80	+ 90	232	195	+ 19
Tractor Shovels**						
Wheel, under 1½ cy	2,590	1,926	+ 34	4,516	1,922	+135
1½ cy & up	1,745	1,267	+ 38	3,012	1,437	+110
Crawler, under 1½ cy	817	513	+ 59	1,330	915	+ 45
1½ cy to 2 cy	1,322	865	+ 53	2,187	2,602	— 16
2¼ cy & up	717	531	+ 35	1,248	634	+ 97
Scrapers, 7 to under 12 cy						
2-wheel	431	153	+182	584	361	+ 62
4-wheel	95	72	+ 32	167	223	— 25
12 cy up, 2 & 4 wheel	1,107	587	+ 89	1,694	1,467	+ 15
Motor Graders, under 75 hp	296	189	+ 57	485	591	— 18
75-114 hp	273	214	+ 26	487	488	— 0.2
115 hp & up	1,704	1,369	+ 24	3,073	2,575	+ 19
Rollers and Compactors						
Rollers, tandem 2 & 3 axle	683	405	+ 69	1,088	1,184	— 8
3-wheel	126	103	+ 22	229	301	— 24
portable	165	70	+136	235	230	+ 2
Compactors ‡	3,019	1,434	+111	4,453	3,450	+ 29
Ditchers & Trenchers						
Ladder, rubber tired (a)	406	244	+ 66	650	415	+ 57
crawler	112	98	+ 14	210	138	+ 52
Wheel	173	132	+ 31	305	179	+ 70
Crushed-Screen-Wash Plants	274	246	+ 11	520	588	— 12
Concrete Batch Plants	400	306	+ 31	706	658	+ 7
Bituminous Asphalt Plants						
Central mix, batch	110	75	+ 47	185	174	+ 6
continuous	49	23	+113	72	74	— 3
Travel mix	(b)	10	. . .	10(b)	29	. . .
Bituminous Distributors	296	193	+ 53	489	530	— 8

†Source: **Facts For Industry,** Series M35D. Includes exports.
*CM&E estimates, based on Dept. of Comm. data. **Integral units only.
‡Self-prop & pull compactors; tamping, sheepsfoot, compaction, rubber-tired, tampers and trench rollers.
(a) Includes some units for tractor mounting (b) Number of shipment in Q2 withheld to avoid disclosing figures of individual companies.

Tractor-Shovel Sales Boom

Rubber-tired tractor-shovels are pacing the big increase in manufacturers' shipments of construction equipment this year.

The biggest gain is in models with a bucket of less than 1½-yd capacity. Shipments of these machines in the first half of 1959 rocketed 135% above last year, according to Department of Commerce figures. And shipments of larger models zoomed 110% above the first half of last year.

Crawler tractor-shovel shipments in the first half of 1959 jumped 97% above last year for models of 2¼ yd or greater capacity.

Many other popular types of construction equipment are in much greater demand this year than last year. Among these are larger size crawler and rubber-tired tractors, two-wheel scrapers, heavy duty motor graders, compactors, ditchers, and trenching machines.

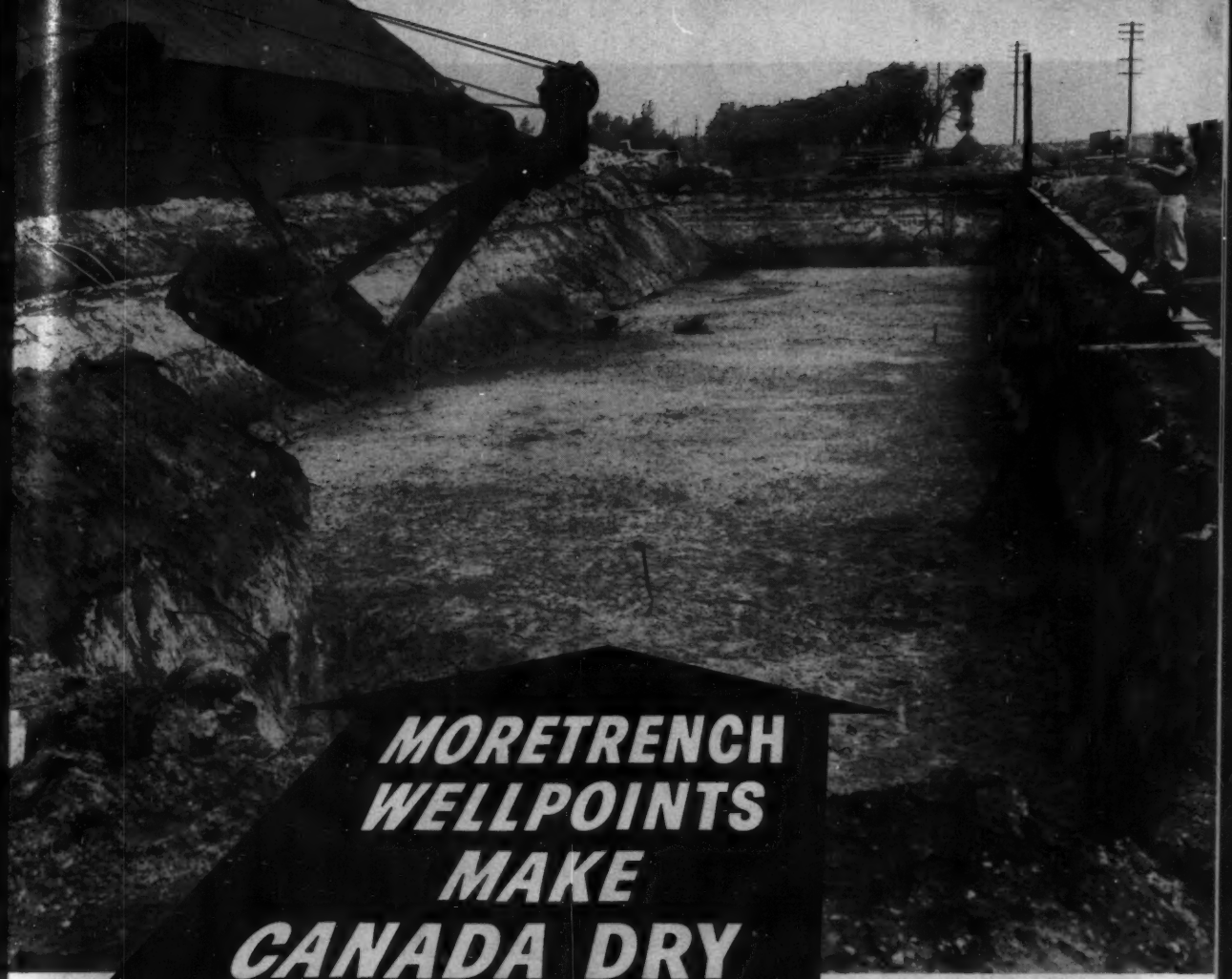
Details of equipment shipments are reported in a quarterly report entitled "Facts for Industry: Construction Machinery." This report is prepared by the Bureau of the Census, Washington 25, D. C. Price is 10¢; or 35¢ per year.

The only major category of equipment not included in this report is power cranes and shovels. But there's some hope that these manufacturers will soon make shipment data available quarterly instead of just annually.

SOME BIG CONTRACT AWARDS OF THE MONTH

Norair Engineering Corp., 118 22 St., N.W., Washington, D.C. Erect a Museum of History and Technology at the Smithsonian Institute, Washington, D.C. General Services Administration, 7th and D Sts., S.W., Washington, D.C. $23,738,680.

continued on page 51



MORETRENCH WELLPOINTS MAKE CANADA DRY

Engineers: Stone & Webster Canada, Limited

In this neat, deep, DRY foundation — 300′ away from Lake Ontario — go the 90″ reinforced concrete pipes which return water to Lake Ontario after it has passed through the condensers in the new extension to Ontario Hydro's Richard L. Hearn Generating Station.

Ground level is 252, water table 246, subgrade 236. Material — sand pumped in from the lake.

(Note the thousands of tons of coal stockpiled close to the excavated area, giving further evidence of soil stability.)

"Much of our success on this project is attributable to the excellent ground conditions created by Moretrench equipment," says John Famigletti, president of Atlas Excavators, Ltd., Toronto contractors for the excavation and installation of the pipe.

When your problem is water, call us. We can help!

Photo courtesy Ontario Hydro Photography Section, Graphic Dept., Information Division.

MORETRENCH Corporation

389 Main Street
Hackensack, N. J.
HUbbard 9-7676
New York Tel.: CO 7-2283

4900 S. Austin Ave.
Chicago 38, Illinois
POrtsmouth 7-4212

7701 Interbay Blvd.
Tampa 9, Florida
TAmpa 61-1881

315 W. 25th St.
Houston 8, Texas
UNderwood 4-7774

Rockaway
New Jersey
OAkwood 7-2100

WESTERN REPRESENTATIVE: Andrews Machinery of Washington, Inc., Seattle 4, Washington
CANADIAN REPRESENTATIVE: Geo. W. Crothers Limited, Toronto, Ontario
BRAZILIAN REPRESENTATIVE: Oscar Taves & Co., Ltd., Rio de Janeiro

Knowledge is like a torch . . .

The higher you hold it the farther it is seen.

At the Perfect Circle laboratories our constant purpose is the acquiring of knowledge of products and their installation which will improve the service an engine gives to its owner.

But we realize the mere acquisition of this knowledge would accomplish but little if we failed to pass it on to those who design, manufacture and maintain the world's motor vehicles and other internal combustion engines. Hence, our researchers freely reveal their findings to all automotive engineers and their organized associations. For those who service and maintain internal combustion engines, we periodically hold local Doctor of Motors clinics. In the field, our technical staff is always available for help and counsel.

We give of knowledge that we may receive it from others.

Perfect Circle

Piston Rings...Precision Castings...Power Service Products...Speedostat

HAGERSTOWN, INDIANA • In Canada: DON MILLS, ONTARIO • PERFECT CIRCLE INTERNATIONAL, FT. WAYNE, INDIANA

CONTRACTS . . . *continued*

Pomeroy-Bates & Rogers-Gerwick, 120 Montgomery St., San Francisio, Calif. A joint venture to construct the 3,350-ft-long Webster Street Tube for two-lane vehicular traffic at Oakland, Calif. State Div. of Highways, 1120 N St., Sacramento, Calif. $16,641,000.

Winston Bros. Co., 1532 California St., Monrovia, Calif., and **Green Construction Co.,** 20 N. San Mateo Dr., San Mateo, Calif. Construct 3.5-mi tunnel, penstock, powerhouse, and related works for the third phase of Kings River Project near Fresno, Calif. Pacific Gas & Electric Co., 245 Market St., San Francisco, Calif. $13,000,000.

Williams Bros., National Bank Bldg., Tulsa, Okla., construct 85 mi of 24-in. natural gas pipeline between Farmington and Pine City, Minn. Northern Natural Gas Co., 2223 Dodge St., Omaha, Neb. $13,000,000.

Hughes Foulkrod Co., 1504 Race St., Philadelphia, Pa. Erect a laboratory and office building with adjacent parking areas at Essington, Pa. Scott Paper Co., Front and Market Sts., Chester, Pa. $10,000,000.

William H. & Nelson Cunliff Co., 3320 Linden Blvd., St. Louis 3, Mo. Construct a research center at Creve Coeur, Mo. Monsanto Chemical Co., 800 North Lindberg Blvd., Creve Coeur, Mo. $10,000,000.

L. G. Defelice & Son, Inc., Nettleton Ave., North Haven, Conn. Relocation of U. S. Route 6 at Danbury, Conn., including 20,840 lin ft of concrete pavement, bridges, and box culverts. State Highway Com., 170 Douglas St., Hartford, Conn. $8,026,990.

Yonkers Contracting Co., 969 Midland Ave., Yonkers, N.Y. Grading, paving, and bridge construction for 2 mi of Route 287 in Somerset County, N.J. State Highway Dept., 1035 Parkway Ave., Trenton, N.J. $5,333,902.

Fegles Construction Co., 2110 Nicollet Ave., Minneapolis, Minn. Construct a grain elevator at Savage, Minn. Continental Grain Co., 26 Broadway, New York, N.Y. $5,000,000.

Precast wall slab being tilted into place by means of Richmond Lifting Inserts and Lifting Brackets.

Richmond Lifting Inserts for Precast Concrete Components

Certified laboratory tests assure proper strength rating for efficient design and performance in concrete at usable strength

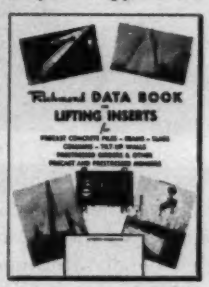
Richmond has developed and tested a complete line of Lifting Inserts and accessories for handling and placing of precast concrete wall slabs, columns, beams, girders, piles, etc.

CB-1 SINGLE LIFTING INSERT
CB-2 DOUBLE LIFTING INSERT
IBB INVERTED SLAB BRACING INSERT
EL-S SINGLE END LIFT INSERT
EL-D TANDEM END LIFT INSERT
LL LIFT LAGS
SLS SLOTTED LAG STUD
SBA SLAB ANCHOR
TWB ALL STEEL TILT-UP WALL BRACE
LB LIFTING EYE BOLT
LB LIFTING BRACKET
SLP SWIVEL LIFT PLATE

No matter what type of precast units are involved, Richmond can supply exactly the right type of insert for the specific job.

These units are designed with adequate extra strength and for simple operation in lifting and bracing precast concrete components.

Send for your copy of the Richmond Data Book on Lifting Inserts giving complete technical data, dimensions, working loads and ultimate strengths in various strengths of concrete. At the same time ask for your copy of the latest Richmond Handbook showing the complete line of form tying anchorage and accessory devices for concrete construction backed by 47 years in this field.



Richmond
SCREW ANCHOR CO., INC.
INSIST ON RICHMOND
AND BE SURE IT'S RICHMOND

Main Office: 816-838 LIBERTY AVENUE, BROOKLYN 8, N. Y.
Plants & Sales Offices: Atlanta, Georgia; Fort Worth, Texas; St. Joseph, Missouri. In Canada: ACROW-RICHMOND LTD., Orangeville, Ontario.

QUICK TO LOAD AND HIT THE ROAD

The Allis-Chalmers TS-160 has stepped ahead in the 7- to 10-yd class . . . for good reasons!

Exclusive double-acting bowl jacks. These jacks exert tremendous two-way power—down for fast penetration and big loads in all kinds of material—up for quick getaway. Double-acting pan control also lets operator clean up ditch, shine slopes, landscape and finish roads to blue-top specs.

Highest hp to struck capacity. The powerful Allis-Chalmers engine delivers up to 22 hp per struck yard. More than any of comparable size. That's why the TS-160 loads faster—gets out of the cut quicker with or without a pusher.

Highest rimpull. When it's power you need—in the cut, on haul roads, soft spots or on steep grades—the TS-160 gives you more than 19,300 lb of rimpull—from 17% to over 37% more than others in its class.

KON-TORK differential. When ground is soft or muddy, the KON-TORK differential constantly transfers power to the driving wheel with the best traction.

In addition, the TS-160— . . . turns non-stop in 24 ft, 8½ in. . . . with finger-tip, 90-degree steering . . . . uses positive, forced ejection to doze all material through high, 85½-in. apron opening . . . distributes loaded weight equally

. . . move ahead with ALLIS-CHALMERS

TS-160 power, speed and exclusive advantages save you time in the cut, give you good getaway power, send you to the fill with a full load. Here's a unit that fits any fleet—can hold its own on production work and pays its way working solo on spot utility and cleanup. Here are the features—look 'em over carefully.

on all wheels for maximum flotation . . . rear wheels run *inside* the 97½-in.-wide cut.

Your Allis-Chalmers dealer has all the facts—see him before you add your next scraper. He'll be glad to show you why a TS-160 may be just what you've wanted to add flexibility to your fleet. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

KON-TORK is an Allis-Chalmers trademark.

AC

power for a growing world

Projected Golden Triangle development at Pittsburgh, Pa.

MACKS help face-lift the Golden Triangle

In Pittsburgh, they're rebuilding the Golden Triangle. Buildings are going up—hotels, offices, garages . . . tunnels are being bored . . . parks are being developed—all with the help of trucks—and Macks are by far predominant!

Contractors prefer Mack trucks for good reasons. Mack dumpers give rugged service, rock-bottom upkeep and full-time availability. And the exclusive Mack Balanced Bogie with Power Divider provides top-notch tractive ability—power is directed to the axle with the best traction—in difficult footing such as sand, gravel or mud.

Mack ready-mix trucks, powered by famous Mack Thermodyne® diesel engines or economical Mack gasoline engines, give contractors the on-time dependability vital for meeting precise pouring schedules.

Day after day, other Mack trucks and tractors haul without fail the tons of materials and equipment needed on every construction job.

You can benefit by using Mack trucks on your next contract. Your Mack branch or distributor will supply you with the names of Mack users in your field. Compare their operating success with your own . . . you'll hand the tough jobs to Macks. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd., Toronto, Ont.

7213

MACK
FIRST NAME FOR
TRUCKS

Yard after yard of ready-mix concrete hauled by Mack trucks is used to build retaining wall at construction site.

Brawny Mack Model B-63SX 47,000 lbs. GVW dumper helps in excavation for Pittsburgh hotel foundation.

Heavy loads meet their match in rugged Mack dumpers, whose quick cycling keeps shovel busy at underground garage project.

NOW... there are 2 Koehring® Dumptors...

Big wide-flared body of the model 100 Dumptor makes an easy target for the sensational new Koehring 205 Skooper. From a "stand-still" position, Skooper makes 5 fast passes with 2-yard bucket, and Dumptor is fully loaded. The full-revolving loader does big bucket digging and loading without the usual drive-in back-out waste motion — and without the high maintenance of skid-turn operation. Skooper's complete digging and loading cycle is: crowd, hoist, swing and dump — then back to digging position — with no traveling.

10-YARD...

with 2-way controls, pivoting seat ...20.8 mph speeds in both directions for fast, no-turn shuttle hauling...

There's no need to turn at the loader, on the haul, or at the dump area with this big 10-yard Dumptor® because it operates with equal ease in either direction. Operator always faces direction of travel — swings around *without leaving seat.* Dual steering wheels, throttle, brake pedals are located at both operating positions of *pivoting seat.* Directional travel and speed-range lever, and dump controls, are centrally located for 2-way operation. Constant-mesh transmission with smooth torque-converter drive gives speeds up to 20.8 m.p.h. in *both* directions. High or low speed range controlled by easy-acting hydraulic clutches. It hauls up 28½% grades fully loaded — has 30,000-lb. payload capacity — power steering — big- safe, 4-wheel airbrakes, plus parking brake. And that's not all — there are two ways to dump — *instantaneous* gravity, or *controlled* gravity with hydraulic cylinders. See Koehring distributor about it, or send for literature.

6-YARD

... Companion-model 60 Dumptor also offers cost-cutting advantages for your heavy-duty off-road hauling. Smaller in size but just as rugged as the larger Dumptor, it has a ton of strength for every ton of payload capacity — 6 H.P. for every ton of loaded weight. It accelerates fast — climbs 23% grades or ramps fully loaded. Has 3-speed travel in both directions —one-second gravity dump. Get all these advantages on your work—haul with Dumptor.

KOEHRING
Division of Koehring Co.,
MILWAUKEE 16, WISCONSIN

K909

PICTURE OF THE MONTH

Form Stripper Deluxe

• An all-aluminum scaffold riding on rubber tires helps strip wood forms from the concrete deck of a steel bridge. Contractor Johnson, Drake & Piper, Inc., New York City, devised it for a job in Buffalo. Men can work safely and efficiently on its 12x40-ft platform, which swings clear to pass around the piers of the bridge.

Above: This dramatic view of Shasta Dam in California demonstrates the progress made by construction engineers in conserving water supply, preventing flood destruction and to provide water needed to make arid or drought-stricken land useful again.

SYMONS® CONE CRUSHERS

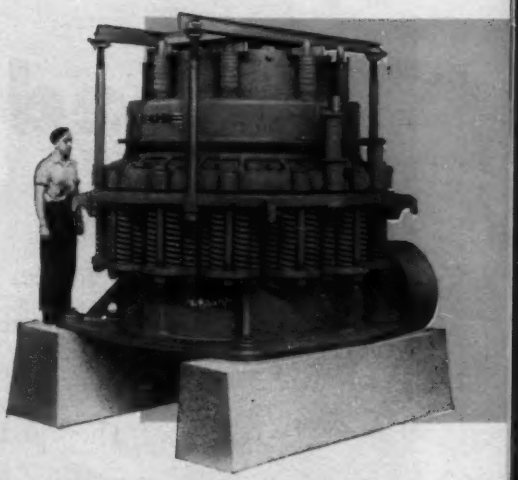
produce big tonnages of quality construction materials at low cost per ton

Illustrated here are typical examples of the vast contributions to the progress of mankind being made by the construction industry. Technological advancement in civil engineering of huge construction projects such as these call for rigid specification aggregates, crushed sand and cement. To meet the constantly growing demand for vast tonnages of these quality construction materials, Symons Cone Crushers have long been the first choice of leading producers throughout the world.

For in the production of construction materials . . . *as in all of the great ore and industrial mineral operations the world over* . . . there has been no record to equal the performance of Symons Cone Crushers that have so consistently and efficiently produced great quantities of finely crushed product at low cost.

Whether you are a contractor, operator, construction engineer, designer or manufacturer, it will pay you to specify and use Symons Cone Crushers . . . as well as the other Nordberg Machinery for the construction industry . . . *all* designed and built to deliver maximum output at lowest possible cost. *Write for literature.*

SYMONS . . a registered Nordberg trademark known throughout the world



SYMONS CONE CRUSHERS

. . . the machines that revolutionized crushing practice . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to over 900 tons per hour.

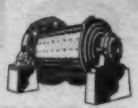
Far left: To meet the challenge of the jet age, engineers and contractors are being called upon to build and expand airport runways to handle the ever-increasing traffic. (View shows Lambert Field, St. Louis).

Left: This view of one of the interchanges on the high speed Detroit expressway is a striking example of the contribution the construction industry is making to the tremendous highway expansion program.

©1959, N. M. CO.

CSBB

SYMONS PRIMARY GYRATORY CRUSHERS

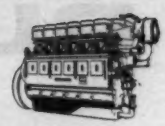


NORDBERG GRINDING MILLS

SYMONS VIBRATING SCREENS

SYMONS VIBRATING GRIZZLIES

ROTARY KILNS and COOLERS



NORDBERG ENGINES

NORDBERG MFG. CO.
Milwaukee 1, Wisconsin

NORDBERG

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY • MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS
SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • JOHANNESBURG • LONDON • MEXICO, D. F.

NOW!

A complete Purolator priced and packaged

For greater fleet economy and efficiency—Purolator's line of paper and waste type oil filters are now all available at special fleet prices in the famous Pur-Pack.

The Pur-Pack lineup of filter cartons covers virtually every filter type for fleets—in 6, 12, and 24-element quantities. The result—you can combine the cost-reducing qualities of superior Purolator filtration with the first-cost savings and new conveniences of Purolator.

Your Local Supplier has a stock of specially priced Purolator Filters in Pur-Pack cartons. Call him today—or write for prices and complete information.

FOR MAXIMUM ENGINE PROTECTION

PUROLATOR

OIL, AIR & FUEL FILTERS

PUROLATOR PRODUCTS INC., RAHWAY, N. J.; TORONTO,

Filter Line for fleets!

Purolator Oil Filters for Fleets are available in durable, money-saving Pur-Pack cartons—in the type you require, and the quantity you need.

ONTARIO, CANADA

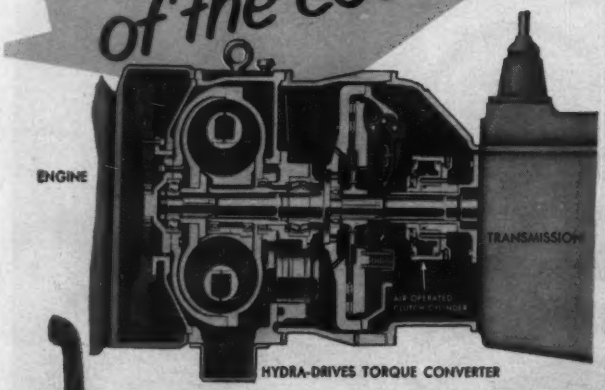
"Purolator" and "Super-Micronic" Reg. U. S. Pat. Off.

HYDRA-DRIVES®

TORQUE CONVERTER WITH A STICK SHIFT TRANSMISSION!

Now! Many Of The Advantages Of Power Shift Transmission *at a fraction of the cost!*

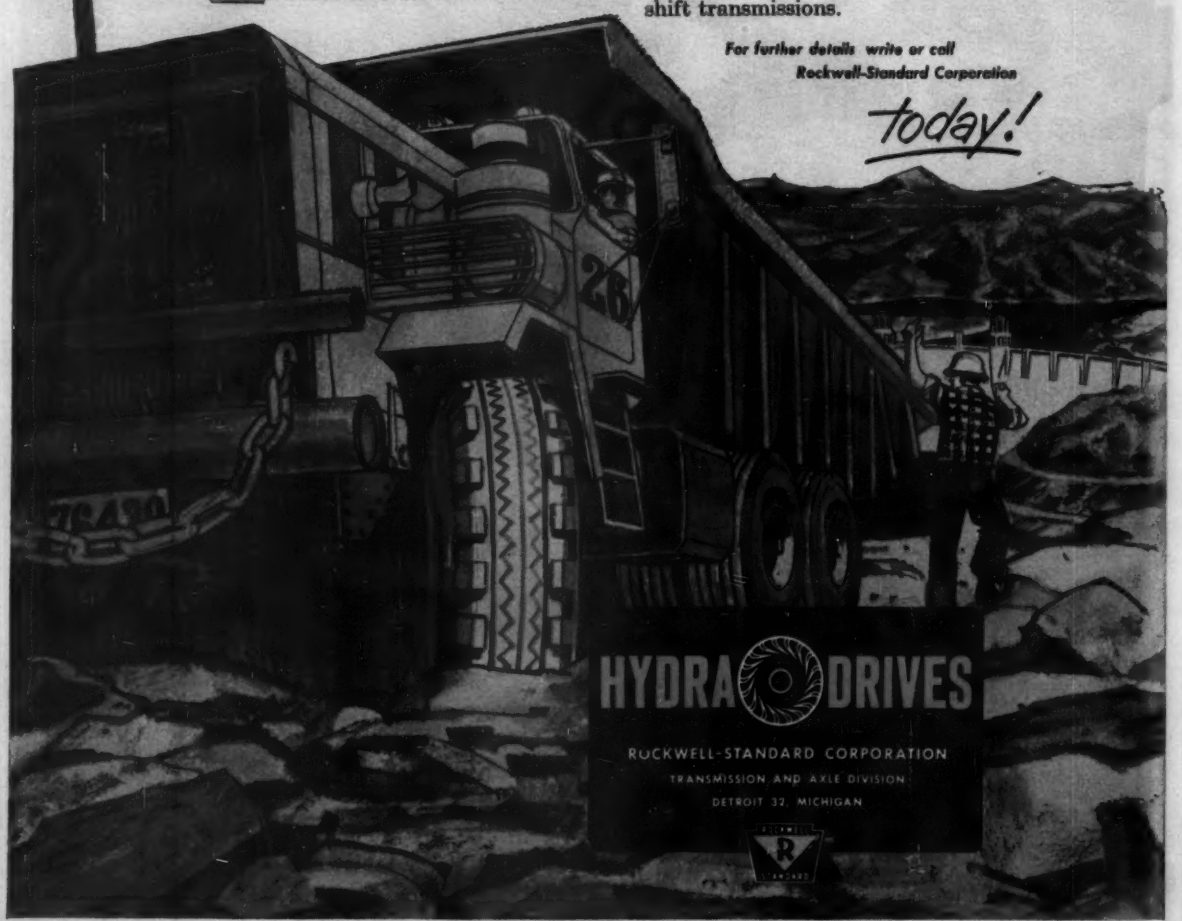
Lower in initial costs, Rockwell-Standard's Hydra-Drives Converter with stick shift transmission reduces operating and maintenance costs on heavy-duty off-highway trucks. You get these five major advantages plus many others:



1. Up to 80% of shifting is eliminated. Select a transmission ratio to fit the haul, and let the converter handle the changing load conditions with a minimum of gearing. Any required shifting can be done while truck is in motion!
2. Greatly reduces shock loading on all drive components.
3. Clutch adjustments and wear problems minimized.
4. A minimum of driver training is required.
5. Cost is hundreds of dollars less than full power shift transmissions.

For further details write or call
Rockwell-Standard Corporation

today!

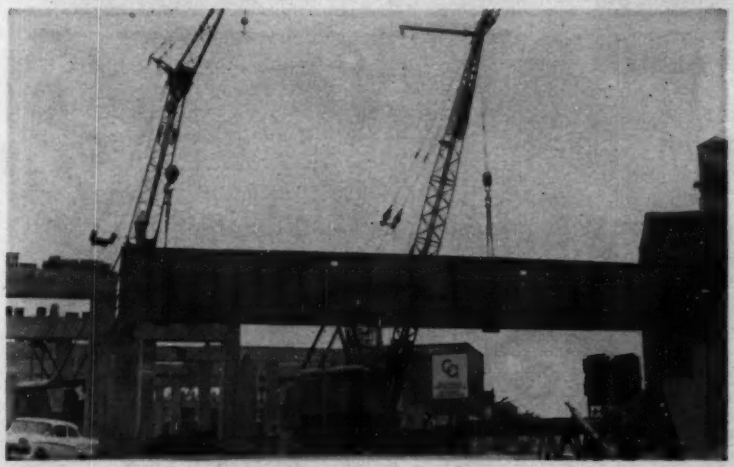


ANOTHER PRODUCT OF **ROCKWELL-STANDARD** CORPORATION

Construction News in Pictures . . .

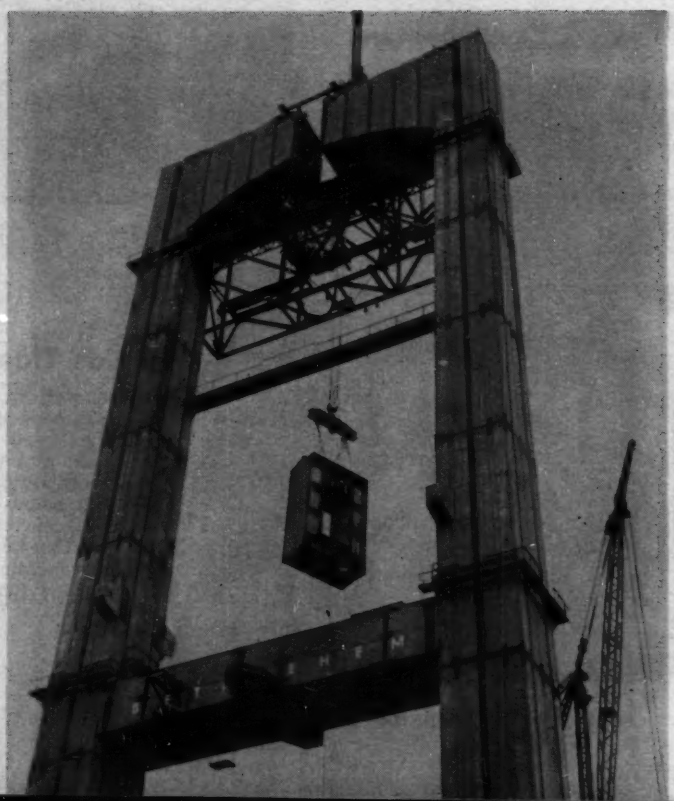
Digging a New Lock

Northwest shovel loads LeTourneau-Westinghouse rear dump truck with dirt and rock. Job is improvement of navigation facilities at Lock and Dam No. 41 on the Ohio River at Louisville, Ky. Jenkins and Wigner Construction Co. of Oklahoma City, Oklo., has a contract for the removal of 1,850-000 cu yd of earth and rock.



Expressway Bridge

A pair of cranes—one a Manitowoc, the other a Lima—place a girder for a bridge that will carry the Northwest Expressway over Ashland Avenue in Chicago. Girder is part of a 1,550-ft bridge for a six-lane section of the expressway. James McHugh Construction Co. is the general contractor. Vogt and Conant is the steel erector.

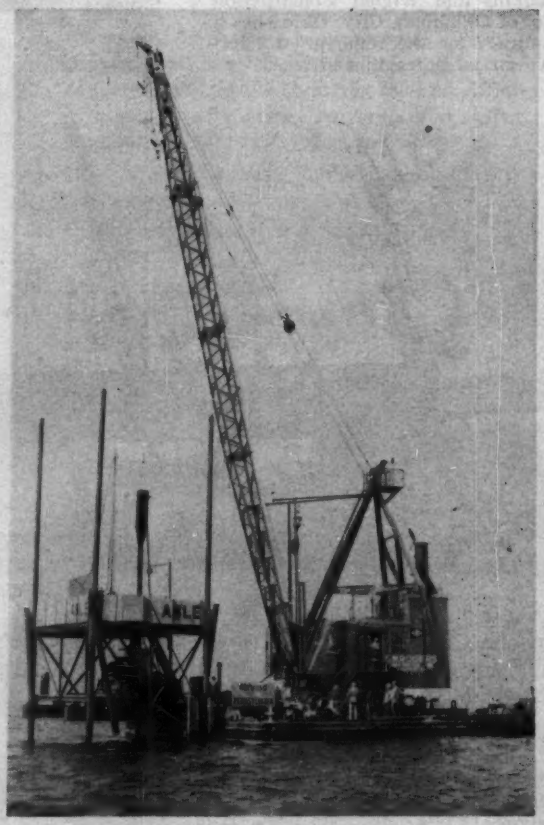


Closing Piece

Stiffleg derrick places the final steel for one of the two towers that will support the 1,800-ft suspension span of the Throggs Neck Bridge in New York City. A special frame jacks the tower legs slightly apart to permit fitting in the 35-ton center assembly for the strut. Bethlehem Steel Co. is the contractor.

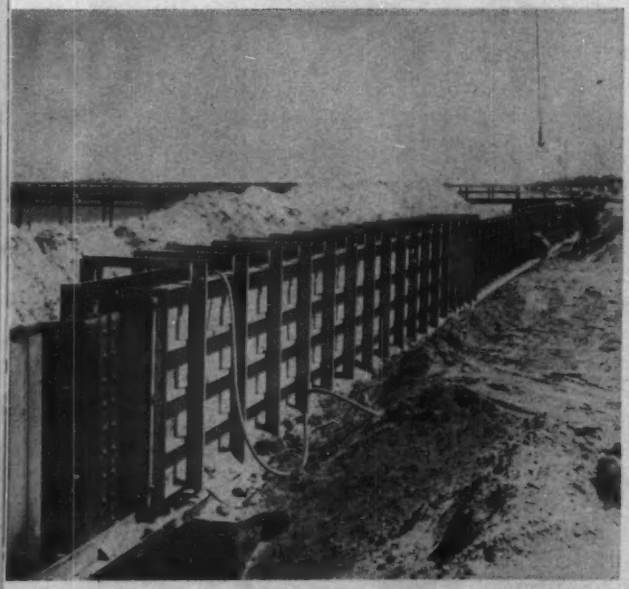
Stage Construction

In a single pass, this P&H Stabilizer mixes cement, water and aggregate for a soil cement road near Raton, N.M. Asphalt will be sprayed over the surface and the road opened to traffic. Later, 8 in. of concrete paving will be placed on the soil cement base. Z. H. and W. E. Lowdermilk of Espanola, N.M., is the paving contractor.



Exploring Bedrock

Floating crane operated by Geo. W. Rogers Construction Corp. drives pipe piles at each corner to pin a drilling tower to the bottom of New York Harbor. Three of the towers are making borings in bedrock to chart a route for a $25-million aqueduct tunnel. Joint venture contractors are Raymond International, Pennsylvania Drilling Co.



Holds Tides

A sea wall at Wollaston Beach, Mass., is made of interlocking sheet piling enclosed in concrete. Piling is driven as much as 43 ft deep. The upper 9 ft of the piling, including 6 ft below sand level, is encased in concrete. Sallah & Pecci Construction Co. of Boston is pouring the concrete into especially designed Blaw-Knox steel forms.

IN SPANKIN' NEW PRODUCTS...

FRAM RANKS *FIRST!*

As the world leader in filtration research, FRAM continually provides over 400 manufacturers with new, advanced filter products. Example: FRAM developed the dry-type carburetor air filter – now original equipment on all major makes of today's cars! Next filter order, insist on FRAM!

Anyway you look at it...FRAM ranks first!

- More equipment manufacturers install FRAM...
- More car owners prefer FRAM...
- More dealers recommend and sell FRAM than any other filter brand!

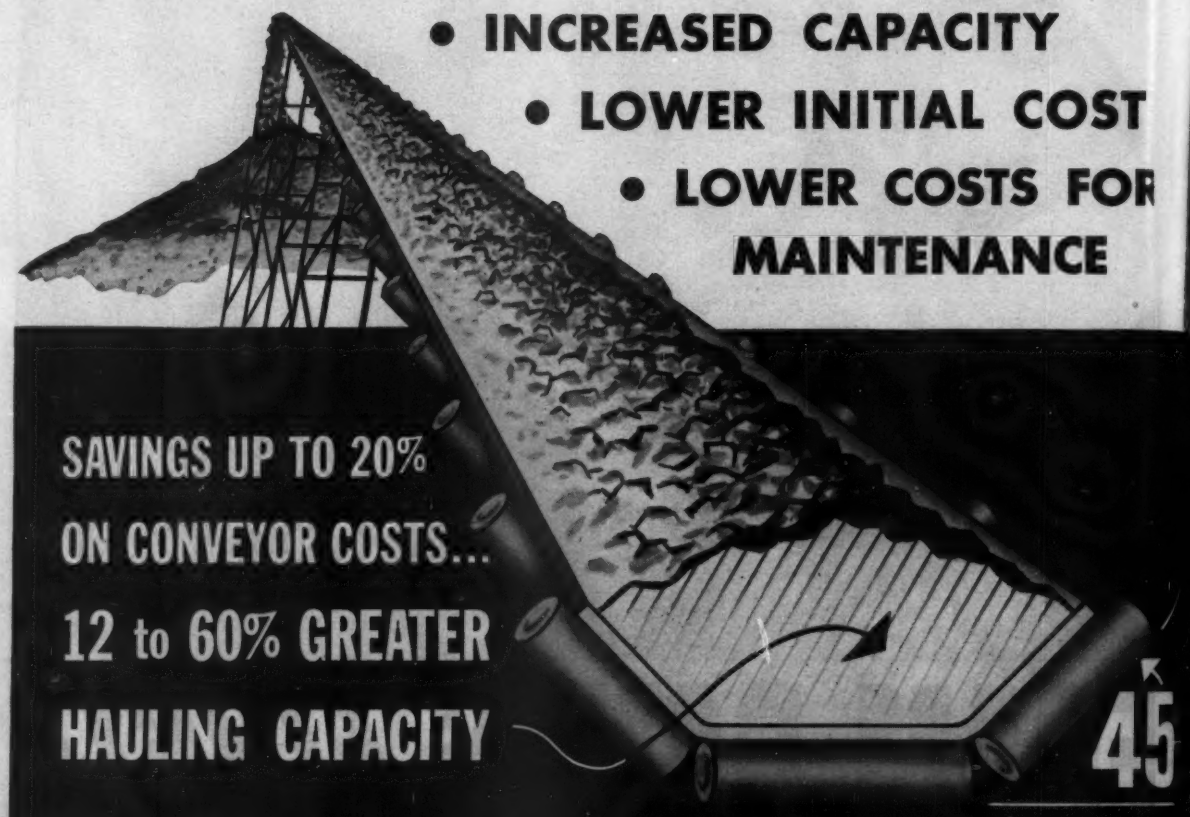
FRAM CORPORATION, Providence 16, R. I.

FRAM
OIL · AIR · FUEL · WATER
FILTERS

MOST IMPORTANT NEWS

NOW YOU CAN USE 45° IDLERS

- INCREASED CAPACITY
- LOWER INITIAL COST
- LOWER COSTS FOR MAINTENANCE



It's a mathematical certainty that a belt can haul bigger loads with 45° idlers than with regular 20° idlers. But the 45° angle between concentrating idlers and bottom roll idlers is too sharp for an ordinary heavy duty conveyor belt. Plies separate, but modern RAY-MAN CONVEYOR BELT licks this problem . . . for all time!

Ray-Man's exclusive flexible construction and built-in stress compensation is guaranteed to take the sharp angle of 45° idlers without ply or cover separation at the hinge line. This opens a whole new era of conveyor design . . . permitting larger loads . . . narrower conveyors . . . assuring longer cover wear . . . lower handling costs!

RAY-MAN GIVES YOU "*MORE USE PER DOLLAR*" WITH 45° IDLERS

IN CONVEYING TODAY!

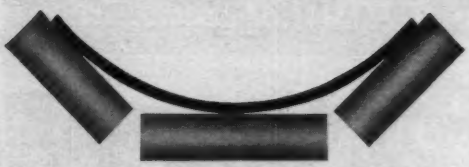
...TO HANDLE ALL MATERIALS

BIGGER LOADS, LESS SPILLAGE, LESS WEAR ON COVER WITH 45° IDLERS

20° IDLERS REQUIRE WIDER CONVEYOR TO HAUL SAME TONNAGE

Only RAY-MAN CONVEYOR BELT is BUILT to take the EXTRA STRESS OF 45° IDLERS

RAY-MAN IS GUARANTEED NOT TO PLY-SEPARATE AT 45° ANGLES



ORDINARY PLY BELTS ARE TOO BOARDY TO TAKE 45° ANGLES

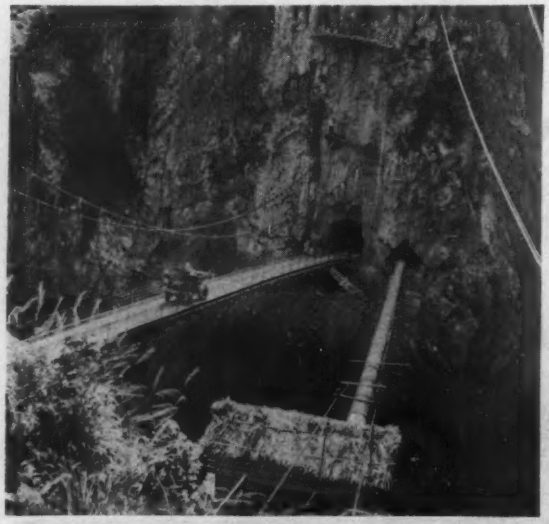
Ask your R/M representative to show you how Ray-Man Conveyor Belt with 45° idlers can give you the most for your conveyor dollar . . . write for new Bulletin M303, "Ray-Man for 45° Idlers."

RAYBESTOS-MANHATTAN, INC.
MANHATTAN RUBBER DIVISION, PASSAIC, NEW JERSEY

RM

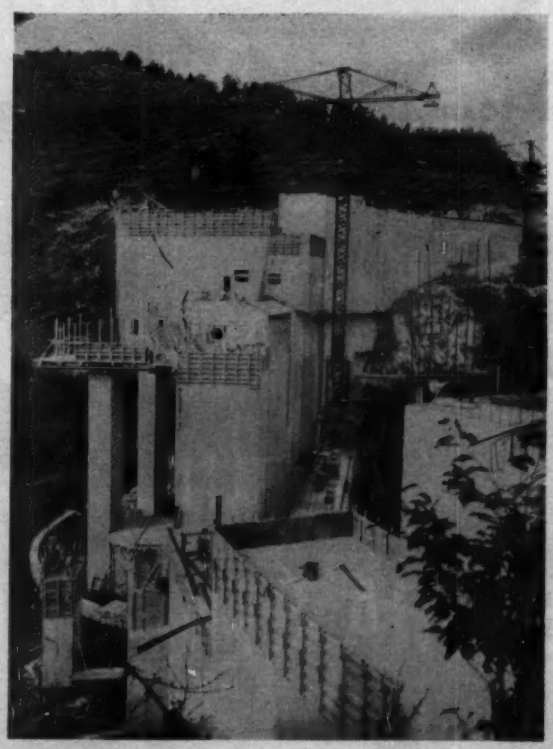
RM-861
ENGINEERED RUBBER PRODUCTS ... MORE USE PER DOLLAR

Construction 'Round the World . . .



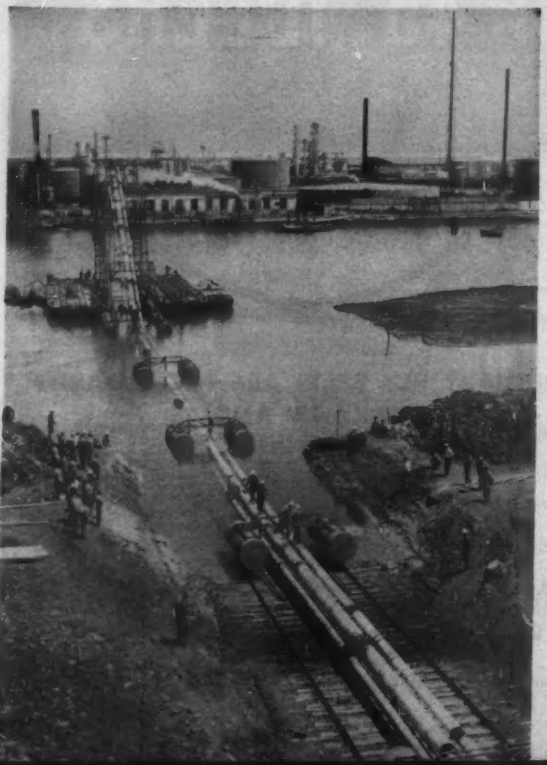
In Taiwan

Temporary suspension bridge leads to entrance of underground vault in which the Ku-kuan power station is being built in Ta-chia Valley development project. Imbedded in hill of solid rock, plant will be immune to floods or typhoons. Engineers cut access roads through gorges to reach site and built five service bridges to move supplies.



In France

Two tower cranes, one traveling along a temporary service bridge and the other stationary, pour concrete for the arch-type Grangent Dam across the River Loire. Built in 13 blocks, the dam will impound water for two 19,000-kva turbines in downstream power station. Formwork is erected on blocks and upstream breakwater piers.



In Italy

Barge pulled by winches carries three large diameter pipes, launched down ways in foreground, across Venetian canal to oil refinery. Scaffolding mounted on barge supports pipes, which are bent to conform to embankment. Entire operation, including submerging pipes into concrete channel in canal bed, blocked waterway for only 15 hr.

CHEVROLET

They're rolling in with the biggest news since trucks began

1960 CHEVROLET TRUCKS WITH TOTAL NEWNESS!

Chevy's here with the hottest news for

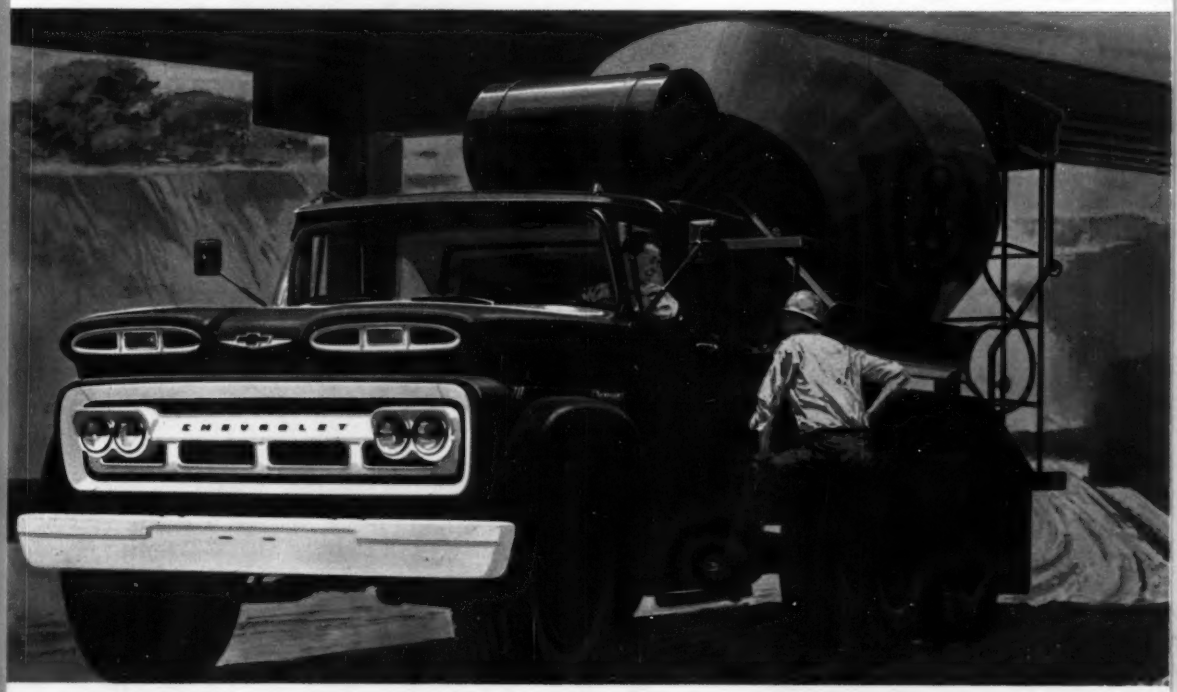
NEW TORSION-SPRING RIDE

- *Years in the making, it's the most significant improvement in truck performance in decades!*
- *It's here to lengthen truck life . . . protect cargoes . . . speed up schedules . . . reduce driver fatigue . . . cut truck maintenance costs to new lows. It's ready to save you time, work and money like nothing in trucks has before!*

See how Chevrolet for '60 has engineered a revolution in trucking

...one that can make any truck route in America a far smoother road to bigger profits for you!

truckers since coffee was invented!



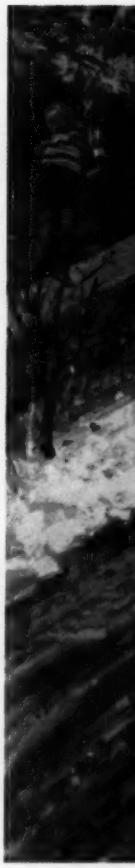
NEW STYLE NEW MODELS

- *All-new styling . . . new Comfort-King cabs with more room, convenience and horizon-wide visibility . . . new sturdier construction for longer truck life!*
- *Dozens of new models for '60! New bigger capacity pickups and panels, new high-style Suburban Carryalls, new tougher built tandems and chassis-cabs! New power improvements, too!*

. . . see how they've re-designed everything to bring you a new kind of tough-truck durability and saving ability!

NEW CHEVROLET TORSIO

The smoothest thing that ever came between a road and a load!



Years in the making, this amazing suspension system, featuring torsion bar springs, is standard equipment in all classes of 1960 Chevrolet trucks—in fact, it is provided in every model with the exception of forward control and 4-wheel drive! It protects everything from the bumps and jolts that used to wear down trucks and truckers . . . provides a totally new kind of trucking that improves almost every phase of operation!

Independent front suspension with tough torsion bar springs . . . for trucks!

This totally new development improves *many* phases of trucking—does more for you than any other single feature ever introduced!

Chevrolet Torsion-Spring Ride, you'll find, eliminates the old-fashioned I-beam front axle. Gone, too, are friction-producing front leaf springs. Instead, each front wheel is suspended independently of the other. And tough-steel torsion bars extend back on either side of the chassis. They assist the low-friction spherical joints and control arms in providing precise wheel action and a *new kind* of truck springing. Independently suspended, each front wheel steps cleanly over bumps. And the friction-free torsion bars work to absorb each jolt or jar; they flex freely, even on the smallest bumps, yet have the capacity to absorb severe shocks. The result is a truck ride so wonderfully smooth that it must be experienced to be believed!

Three tailored-to-the-truck rear suspensions.

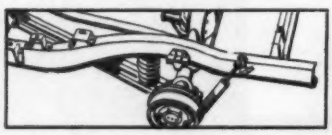
Chevrolet's new truck-built torsion-bar independent front suspension is complemented perfectly by these new rear suspension systems.

In Series 10 and 20 models, frictionless, high-capacity coil springs cushion the rear axle ideally. Rugged radius arms and a lateral stabilizer provide precise axle control.

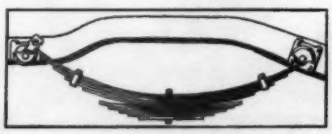
In Series 30 and 40 models,* a new two-stage leaf spring rear suspension affords tailored springing action for all hauling conditions.

In Series 50, 60, 70 and 80 models, all-new variable-rate rear suspension provides spring resistance that adjusts automatically to assure ideal cushioning for any size load.

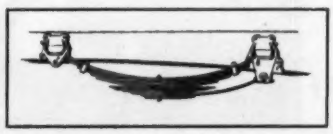
With these three advanced rear suspension systems, Chevrolet's new Torsion-Spring Ride adapts ideally for use in any size truck . . . brings a new, easier, more durable and profitable brand of hauling to every weight class!



New frictionless coil spring



New two-stage leaf spring



New variable-rate leaf spring

*Optional at extra cost

Here's
evoluti
driver's

New C
tional r
and the
as *tough*
and thr
the wor
In fact
new To
sets of

It's h
mainter
your ca
. . . sa
and jolt

and jolt
working
As a res
than ev

SION-SPRING RIDE !

It's the next best thing to paving every road in America!

Here's an advance that signals a new forward evolution in trucks, and puts *you* in the driver's seat as you've never been before!

New Chevrolet Torsion-Spring Ride, the sensational result of torsion bar suspension up front and the right kind of springs in the rear, is just as *tough* as it is smooth! It's truck-built through and through, designed specifically to weather the worst beating a bruising run can dish out. In fact, in exhaustive torture tests, Chevy's new Torsion-Spring suspension outlasted *many* sets of conventional springs!

It's here to add years to truck life . . . reduce maintenance costs to new lows . . . protect your cargoes better . . . speed up your schedules . . . save the driver from exhausting jounces and jolts!

It adds years to truck life and cuts maintenance!

Every truck component benefits from this remarkable new truck ride. The jars and jolts that used to hammer at parts and shorten working life are now cushioned by the suspension. As a result, the truck is bound to last much longer than ever before!

It protects cargoes!

Whatever you haul—from eggs to elephants—you can count on your cargoes reaching their destinations in better shape in a 1960 Chevy with Torsion-Spring Ride. Cargoes virtually "float" over road shocks on the new suspension . . . and the benefits are sure to show up on your profit reports.

It saves the driver!

These new Chevies do wonderful things for drivers, as well as owners. Gone completely is the traditional rough truck ride with its I-beam shimmy and wheel fight. Chevy's smooth-going torsion springs are designed to add years to a driver's working life, keep him fit, fresh and on the road and increase his satisfaction with his job.

It speeds up schedules!

Bad roads have always been a bugaboo for truckers. But you'll find staying right on schedule much easier in a new Chevy Torsion-Spring hauler. The new suspension cushions road shock, gives better, safer vehicle control, enables you to maintain better speeds . . . to serve your customers more promptly and profitably!

NEW STYLING, NEW MO

. . . newly engineered for extra savings thr

Totally new light-duty models

Rolling in on revolutionary torsion springs, these new Chevies are smooth as silk yet tough as nails! Their totally new performance qualities are nothing short of remarkable . . . and wait till you see what they do to your cost records!

Here's the longest line of light-duty Chevies ever. It offers virtually every type of truck known in this weight class—including some big new Series 40 chassis-cabs and stakes with G.V.W.'s up to 14,000 lbs. Every model comes handsomely decked out in a new kind of truck styling that works as well as it looks—adds to your safety, comfort and convenience. And every model offers a new lower-to-ground build (without sacrificing road clearance) which improves truck stability and makes cab entry easier.

Model C1403 Chassis-Cab

Totally new middleweights!

You can choose your truck from sixty-six models, including the brand-new economy models of Series 50 . . . haul bigger profit cargoes, thanks to G.V.W.'s up to 19,500 lbs. and stronger components!

Chevy for '60 is coming out big in the middleweight class, putting a virtual mountain of new truck muscle against your tough medium-duty jobs. Never before have components been so brawny; components such as the new frames with massive "K" and "X" braces and rigid box-section side rails that boost load-carrying ability to new highs. Or the big new standard brakes—11-inch vacuum-hydraulic power units that assure extra braking power under all conditions. And the new suspension—with torsion-bar front springing and new variable-rate rear springs—is just as strong as it is smooth!

Totally new heavyweights!

These new torsion-spring heavy-duty trucks make mammoth hauls much easier than ever before—easier on the driver, load and truck alike! The ability of the new suspension to cushion road shocks keeps everything in good shape far longer and, as a result, your truck dollars go miles farther than ever before!

Dependability, low maintenance, minimum downtime—these are the big-truck benefits that are due to take on new and better meanings when Chevy's new heavyweights take the field in force. With their totally new ride and ruggedness, and with the latest in V8 power, they're out to slash everything that gets in the way of owner's profits. That, you'll find, is a fact—whether you use top-tonnage tandems or big conventional trucks.

Model M7503 Tandem

MODELS!

gs through extra strength!

Model L5603 LCF Chassis-Cab

Note: Special bodies and/or vocational equipment illustrated are not the products of Chevrolet and are not intended to represent those of any specific manufacturer.

NEW COMFORT-KING CABS

Chevrolet's all-new cabs for '60 fully match the revolutionary new chassis in ability to bring new ease and dollar-saving durability to your daily hauls. Special benefits turn up everywhere. For instance, in light-duty models new Chevy cabs are lower for easier entrance and exit. And there's *more space* in all cabs—5 inches more shoulder room, 6 inches more hip room, and more leg room and head room, too! And Chevy's new double-walled cowl, new double-panel roof construction . . . plus sturdy reinforcements throughout, provide extra rigidity, ruggedness and longer life.

New Custom Cabs! For extra ease and working style, Chevy provides totally new Custom Cabs for '60, available in all cab models. They bring you: distinctive exterior chrome moldings . . . handsome chrome grille (light-duty models) . . . new Super Cushion Seat . . . sunshade, armrest, cigar lighter and control knob trim.

NEW TOUGHER BUILT TANDEMS

They're the best built tandems in Chevy history, with tough 7,000-lb. rated independent torsion-bar front suspension, Hendrickson RT320 rear suspension and two 16,000-lb.-capacity Eaton rear axles. It's a new component lineup you just can't beat for dependable service on maximum payload runs! For extra-heavy work, a brawny 9,000-lb. independent front suspension with torsion bar springs is also available, at extra cost.

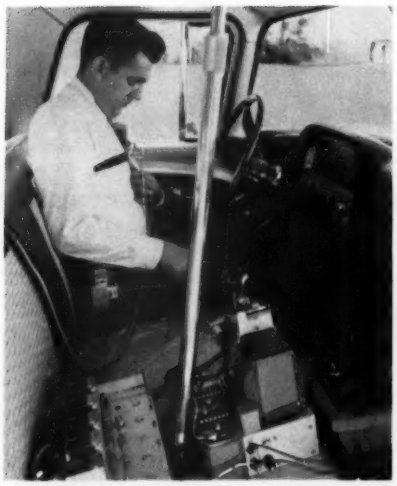
and they're POWERED to improve your profit picture, too!

Chevy for '60 offers a *wide* choice of better-than-ever powerplants; in virtually every Series you can choose from famous economy 6's or V8's that lead the field for efficient short-stroke design! Three big 6's and four advanced V8's with up to 230 horsepower give you the flexibility to match the engine to your job needs for top performance and economy. And these modern engines are *loaded* with durability features to keep them going on tough jobs.

THEY'RE THE SMOOTHEST TRUCKS EVER BUILT

New Chevrolet Torsion-Spring Ride is something you'll appreciate fully only after you've experienced it for yourself. But these comparative test results, electronically recorded, will give you some idea of what an amazing difference new Chevrolet Torsion-Spring Ride really makes . . . some idea of why it's certain to put you on a far smoother road to bigger hauling profits than you've ever known before!

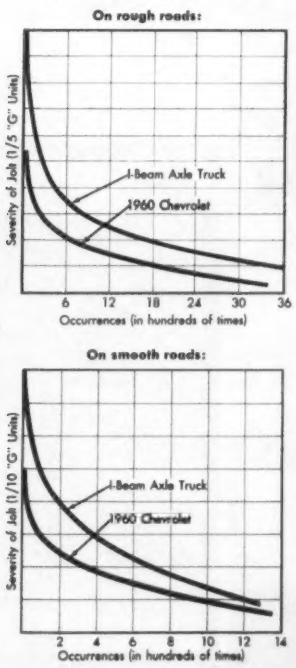
Employing the very latest in test instrumentation, recording and analytical techniques, Proving Ground engineers have made exhaustive comparison studies to find out just how good the new Chevrolet ride really is. Their ride test data were compared with comfort-discomfort limits established by leading independent ride researchers, based on the individual reactions of thousands of people throughout the world.



Heavily instrumented test driver prepares to make a ride run in a '60 Chevrolet truck. Strapped-on accelerometers register the severity of jolts felt by test driver in both vertical (bounce) and horizontal (pitch) directions. Accelerometer readings on the '60 Chevy truck are fed by cable to a companion vehicle, where they are tape recorded for later analysis by electronic computation. The result is an accurate bump-by-bump picture of each test run.

Here's what they found out: *In every respect and under every road condition, the 1960 Chevy out-rides old-style trucks by a tremendous margin!* For instance, in terms of vertical "bounce," Torsion-Spring Ride eliminates as much as 78 per cent of the uncomfortable motion found in I-beam front-axle trucks! In other respects, too—pitch, side shake and sway and their effects on both driver and cargo—Chevrolet is 'way ahead on every count!

JOLTING OF DRIVER —VERTICAL BOUNCE



Ride-test data were analyzed in terms of number of jolts registered of various sizes, or levels of severity, resulting in comparison graphs like these. The shaded area between the curves represents the overall difference in ride. Thus in this example, comparing 1960 Chevrolet and old-style I-beam-axle trucks of 19,500-lb. GVW rating, Torsion-Spring Ride reduces the jolts harsh enough to cause actual discomfort by 58 per cent on rough roads and 52 per cent on smooth roads (up to 78% in light-duty models!).

...AND THE TOUGHEST!

Chevrolet's exhaustive truck-testing program proved beyond question that *these totally new Torsion-Spring haulers are built to withstand punishment that would put an ordinary truck in the shop for repairs!*

Here are two test reports that typify the thousands recorded during Chevrolet's unprecedented new truck development and testing program.

Chevrolet's tough torsion-bar independent suspension withstood the brutal Belgian Block test like nothing else ever has. One typical test forced the new Chevy trucks to withstand 8,500 miles of continuous travel on the Belgian Blocks—a road surface so jarring that trucks traditionally register failures of one kind or another after the first few hundred miles. Yet the newly engineered '60 Chevies completed all of their runs with no failures of any kind!

Rough railroad tie test proved torsion bar suspension's toughness. Carrying loads far in excess of their rated G.V.W.'s—the new Chevies hit loose railroad ties (specially placed to produce maximum stress on all components) at speeds up to 25 m.p.h. time after time. Even with panic stop braking on the ties, no failures of any kind *ever* developed in either the torsion-bar front suspension or the three new rear suspension systems!

These and countless other laboratory, Proving Ground and field tests proved the total ruggedness and *lasting* ability of the '60 Chevrolet truck product beyond question. For the ride of your working life, see your Chevrolet dealer soon! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

New Torsion-Springs beat brutal Belgian Blocks

"Crossties" test proves suspension's durability

(All illustrations and specifications contained in this literature are based on the latest product information available at the time of publication approval. The right is reserved to make changes at any time without notice in prices, colors, materials, equipment, specifications and models, and also to discontinue models. Chevrolet Motor Division, General Motors Corporation, Detroit 2, Michigan.)

On 1¼ million yard highway job:

3-yard Manitowoc heaps haul units at rate of 160 loads each 8½-hr. shift

An important segment of the Interstate Highway program is now under construction 20 miles Southwest of St. Louis. Here Fred Weber Contractor, Inc. of St. Louis has the contract for approximately nine miles of new Interstate 44.

One section of the 1¼ million yard job is shown here — a 35,000 yard cut paralleling U. S. Route 66. Weber is using a 3-yd. Manitowoc Model 3600 shovel on this cut. An average of 160 heaped haul units are loaded each 8½ hour day. The hauling fleet, six 25-yd. and two 18-yd. units, has a long 12,000 ft. one-way haul, stopping traffic to highball across Route 66.

"Easy as pie" operation

On the same job Weber also has another 3-yd. Manitowoc shovel, a 25-ton Manitowoc Crane driving 50-ft. piles 45-ft. deep, and a 2½-yd. shovel working in a nearby quarry. When interviewed at the job site, Superintendent John R. Weber said, "We're getting very good production from the model 3600. It gives us more output with less maintenance." And the shovel operator, F. C. Warneke noted, "It's easy on the operator because air control makes it easy as pie."

Bonus Output Features

The Manitowoc 3600 gives you air controls, torque converter drive, disc-type clutches, and removable counterweight as *standard* features . . . provides equally great performance as a trench hoe, crane, dragline or clamshell. Analyze your upcoming bids now . . . see how the 3-yd. 3600 can help your profit picture. Your Manitowoc distributor will gladly fill you in on all the facts.

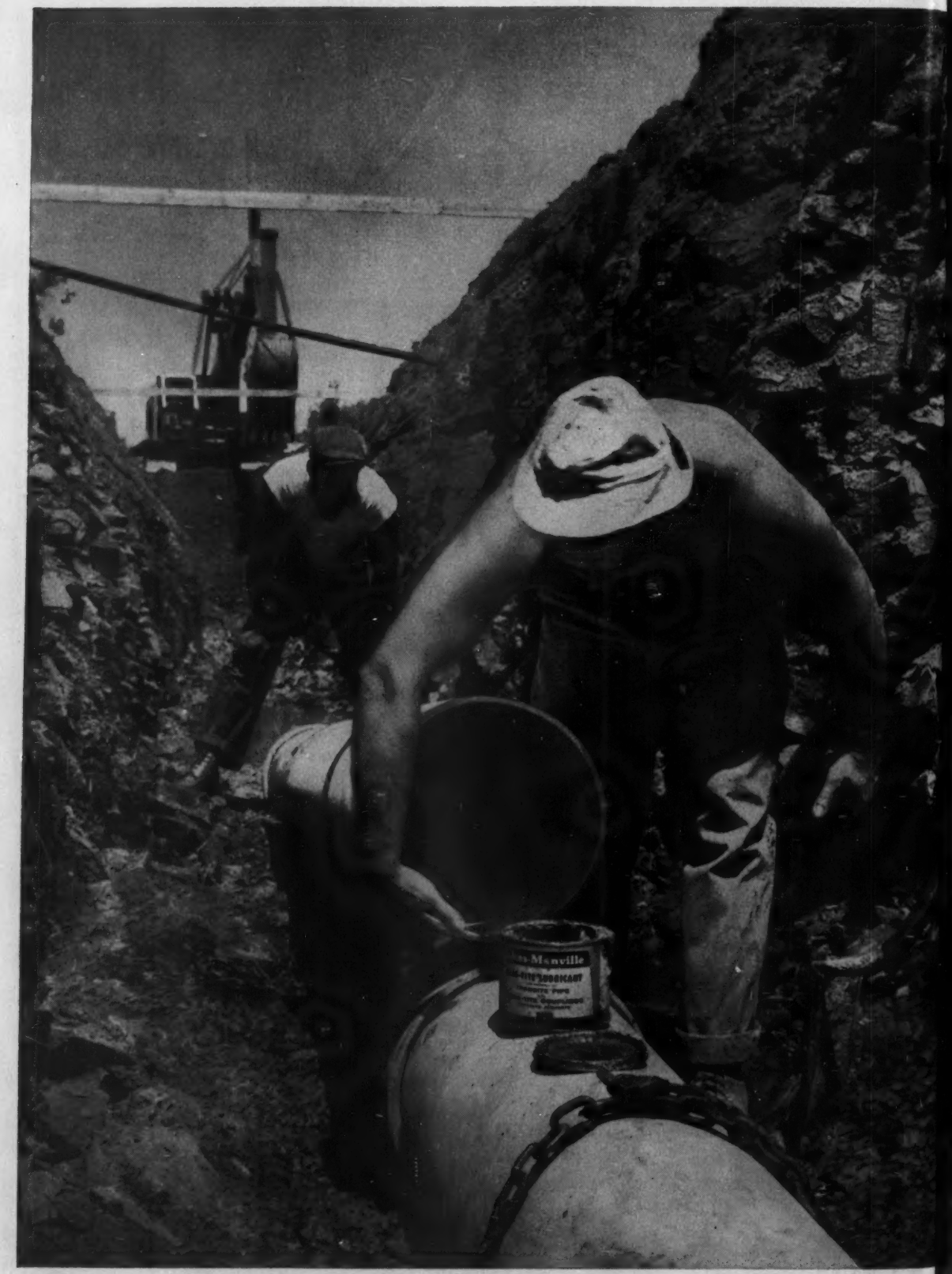
Manitowoc

MANITOWOC ENGINEERING CORP.

(A subsidiary of The Manitowoc Company, Inc.)

MANITOWOC, WISCONSIN

CRANES	SHOVELS	DRAGLINES	TRENCH HOES
25 TON - 100 TON	1¼-YD. - 5½-YD.	1¼-YD. - 6-YD.	1¼-YD. - 3-YD.


Manville

"In one day we can install as much as 600 feet of 12" Transite Sewer Pipe"

Says Ernest Renda
E. Renda & Son Contracting Co.
Green Brook, N. J.

"Today the only way you can show a profit," says Mr. Renda, "is to increase your productivity—to lay more pipe per day. That's why we feel surer working with Transite"...

Mr. Renda continues

"**It is easily handled** on the ground and in the trench. It is quickly assembled and installed. It reduces job site operations to such an extent that we can work with fewer men. Another important Transite advantage is tight joints . . . and there are fewer joints to make. Never any trouble passing leakage and infiltration tests. Long Transite lengths give us a straighter line . . . better grade.

"Working with Transite gives us another advantage—the **Johns-Manville installation service,**" he continues. "Bob Anderson, the J-M field instructor (shown at right, center photo), constantly **advises me on new methods** used on other jobs. And ten years ago, it was this same instructor who taught me to assemble Transite so that I could teach my men how to install it."

JOHNS-MANVILLE

JOHNS-MANVILLE JM PRODUCTS

Transite® Sewer Pipe installs quickly, easily to keep installed costs low . . . its smooth interior permits flatter grades . . . and the Ring-Tite® Coupling answers the toughest infiltration and root problems. Send the coupon for your copy of TR-206A—"The Book Designed with the Contractor in Mind." Mail the coupon now!

Johns-Manville
Box 14 CM, New York 16, N.Y.
Gentlemen: Kindly send me the informative, 16-page Transite booklet which is written especially for contractors.

Name_____

Firm_____

Street_____

City_____

Zone_____ State_____

B.F.Goodrich

V belt briefs

TIPS ON THE CARE, MAINTENANCE AND SELECTION OF V BELTS FOR INDUSTRY

The right way to install and run-in V belts

To get the most possible life out of a set of V belts you've got to install them and run them in properly:

To install V belts:

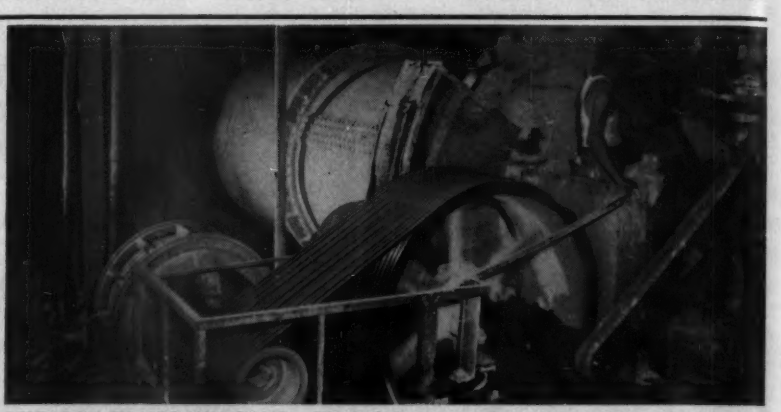
1. Move driver unit toward driven machine so that belts may be placed in sheave grooves by hand.
2. Work belt slack to top side of drive.
3. Move driver unit back into position, eliminating all belt sag.
4. Check sheave alignment.

To run-in V belts:

1. Start unit and operate long enough to permit belts to properly seat in grooves.
2. Stop unit. Adjust centers as necessary until all belts have proper tension.
3. Review adjustment from 24 hours to 48 hours after drive is in operation. This is important, for new belts stretch slightly and seat in grooves before reaching their working lengths.

It pays to keep belts stored properly

V belts should be stored in a cool, clean, dry place. Avoid heat and direct sunlight. Do not hang on nails or other small objects which might cause a sharp bend or tension that would result in a permanent set in V belt. Oldest belts should be used first to keep fresh stock. Matched belts should be banded together so they don't become separated.

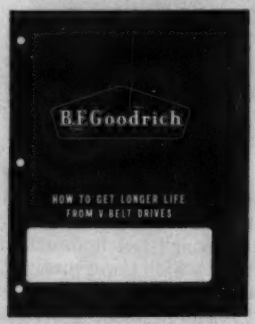


BELTS BOIL IN HOT MILL SAND—*The V belts driving this ball mill help grind hot sand, heated to 260°, to a fluffy powder used for fine glass, pottery, cosmetics. Ordinary V belts were lasting one to two years. B.F.Goodrich Grommet belts replaced them, have lasted over five years. Grommet belts stay cooler because they generate less internal heat and are made of a rubber that takes higher temperatures.*

What caused this V belt failure?

Answer: Prematurely worn sides are caused by grit, dirt or any such abrasive contact. Misalignment often causes wear on one side only. To prevent, align the sheaves, checking with straight-edge or cord. Keep belts and sheave grooves clean.

B.F.Goodrich V belt manual



Your B.F.Goodrich distributor has a new maintenance manual that tells you how to get longer life from your V-belt drives. Its 12 illustrated pages contain information on how V belts work, how to select V belts that fit, how to install, how to keep them running, and how to spot trouble.

Take a look inside with this X-ray of a Grommet belt

This model of a B.F.Goodrich Grommet belt was made of a transparent, flexible material so that you can see its grommet construction. The two endless loops you see are grommets, the load-carrying members of the B.F.Goodrich belt. These are made by winding heavy cord on itself to make an endless cord grommet.

In the actual belt, these grommets float in a bed of solid rubber. You can *see* why every part of the belt is equally flexible—there are no stiff plies to resist bending. Most cord failures occur where cords overlap. But in the B.F.Goodrich Grommet belt with endless cord construction this cause of failure is eliminated.

Ask a factory-trained specialist

For help in selecting V belts for any kind of service, call the man who is a specialist in V belts—your B.F.Goodrich distributor. He can help you cut costs by getting longer life from your V belt drives. *B.F.Goodrich Industrial Products Company, Dept. M-719, Akron 18, Ohio.*

B.F.Goodrich V belts

Construction Methods AND EQUIPMENT

OCTOBER, 1959

VOLUME 41 • NUMBER 10

HENRY T. PEREZ, Editor

Congress and Construction

HOW did the construction industry fare at the hands of the last Congress? In general, it did all right. Good progress was made in the fields of public works and housing (page 11). Even in Highway financing and in labor regulation, at least some progress was made.

Increasing the gasoline tax now, and later earmarking some automobile excise taxes for the Highway Trust Fund has staved off collapse of the interstate highway program. But lack of adequate financing will delay its orderly progress and this will make it cost more to complete. Nevertheless, about $1.8 billion will be available for the interstate system in fiscal 1961 and $2 billion the following year.

As for the so-called labor reform bill, it contains some provisions helpful to the contractor and some beneficial to labor. It is a good compromise bill.

One thing that was not compromised was the secondary boycott issue. Labor's bedfellows wanted the construction industry exempt from the ban on secondary boycotts. But proponents of this legislation was rebuffed by those who would not make construction, in effect, a "second-class" industry.

On the other hand, the labor reform bill does permit agreements between contractors and unions before men are hired. And it stipulates that workers may be required to join a union in seven days. For other industries with union shops the time is still 30 days.

It is to be hoped that the next Congress will enact other legislation that is vital to the continued welfare of the construction industry. One important area that was neglected by the last one is in the field of tax reform.

We have long needed a more realistic policy on depreciation of construction machinery. Next month, the House Ways and Means Committee begins an extensive inquiry into the problems of tax reform in general. It is hoped that recommendations for better depreciation rates will result. And if the construction industry gets behind them, it will advance with the next Congress as it did with this.

DRILLING—Two Gardner-Denver Air Tracs move back and forth on wood platforms projecting on I-beam frame from prow of barge to reach five rows of bore holes across crest and downstream face of dam while fast-moving cascade of water rushes over the crest.

Twin Platforms on Barge Hold

DRILL RIGS mounted on twin platforms projecting from the prow of a barge enabled a subcontractor to drill blast holes through a concrete dam while a head of as much as 3½ ft of water cascaded over the crest.

Cantilevered out over the swift-running water, the platforms supported the drills as they put in five rows of bore holes along the crest and downstream face of the 447-ft-long dam.

Burnbrae, Inc., a Maryland blasting firm, built the rig to demolish Lock and Dam No. 12 on the Monongahela River south of Morgantown, W. Va.

The dam was roughly triangular in shape, 29 ft high, 5 ft wide across the crest, and 24 ft wide at the base. The lock wall, a 350-ft-long concrete structure perpendicular to the dam, was 12 ft thick and 37 ft high.

Burnbrae moved onto the job with a 35x65-ft barge that they brought upstream from Pittsburgh. To hold the two Gardner-Denver Air Tracs assigned the drilling chore, they built two 8-ft-wide wood platforms extending out from one end of the barge on an I-beam frame. Each platform projected 22 ft from the prow of the barge and was held by cables running over a gantry above barge deck. With the barge in position against the upstream face of the dam, the drill rigs reached each row of bore holes by moving back and forth along the platform. A Gardner-Denver 900-cfm compressor at the rear of the barge powered the drill rigs.

A retractable metal bar suspended beneath each platform served as a drilling templet, holding the drill steel securely in position in the swirling current.

During the drilling, the water level varied from 1 to 3½ ft above the crest of the dam. Normally, water on the downstream side was about 12 ft below the crest.

The crew positioned the barge for each day's drilling by winching it along cables anchored upstream on each bank. It was secured along the river wall after each day's operations.

The bore hole pattern along the length of the dam consisted of five rows of 2 3/4-in-dia. vertical holes on 5-ft centers. Spacing of the rows was 4 ft. Altogether the pattern called for a total of 440 holes, each extending 3 ft into the river bed below the base of the dam.

Burnbrae demolished the dam in four shots. Starting at the east end with an 80-ft test section, they worked from east to west, shooting a 165-ft section, a 170-ft section, and finally the remaining 32-ft section of the dam included in the river wall shot.

To shorten loading time, the blasting crew set and charged the entire 415-ft-long section included in the first three shots prior to firing the first blast. Thus the prime consideration in selecting and explosive was that it must be insensitive enough to prevent blast propagation.

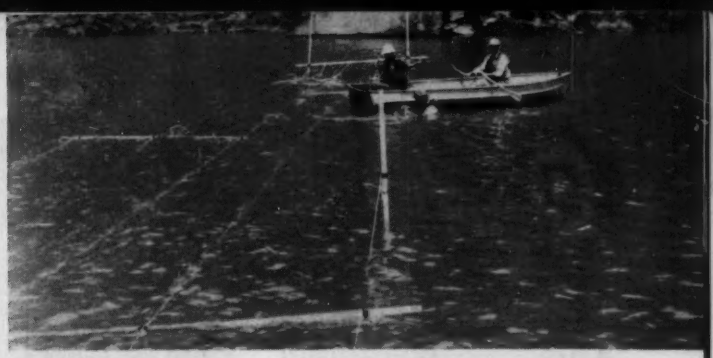
DuPont Nitramon S was the choice for several reasons. It is rugged, highly water resistant, and insensitive to the point that it cannot be detonated by standard blasting caps, but requires its own specially constructed primer. And it's packed in canisters with male and female threads at opposite ends so that cans can be joined in a rigid column. The primer is also packed in threaded canisters, with a tube for insertion of an electric blasting cap or primer cord.

Primed at Same Time

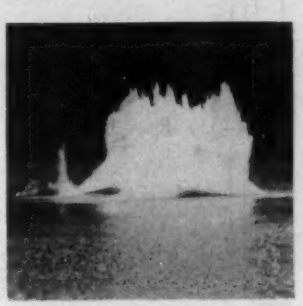
All bore holes for the first three shots were loaded with 2-in.-dia. Nitramon columns and primed simultaneously. A diver in a standard suit and helmet did much of this work underwater. On one occasion, when his own air supply failed, the diver hooked onto the drill compressor, finding that air source satisfactory.

The crew deck-loaded the two upstream rows of bore holes at the crest of the dam. They inserted a primer can at mid-column as well as at the top. The Nitramon primers at the top of each hole were then charged with

CHARGING—Workmen place rigid columns of Nitramon S explosive in first three sections of 447-ft-long dam.



PRIMING—Swimmer ties Primacord leads into firing circuit for test shot. Primacord MS connectors fire the shot in three delays.



SHOOTING—First firing demolishes 80-ft-long test section at east end of dam without propagating blast in two adjacent sections.

Drill Rigs

lengths of Primacord. Stakes secured the ends of the cord until they were tied into the circuit.

Throughout the job there was serious difficulty in both drilling and loading operations because of the poor condition of the aged concrete. It was porous and crumbling in many areas, causing loss of bore hole depth.

Both air jetting and water jetting failed to clear the holes clogged with rotten concrete. In fact, jetting aggravated the situation. Some of the holes had to be drilled three times.

The rigid columns of explosive proved essential. It was found that ordinary sticks of dynamite floated out of place into crannies deep in the deteriorating concrete.

Fire Test Shot First

The first firing was a test shot designed to demolish the 80-ft section at the east end of the dam, furthest removed from the dam maintenance area on the west bank where there stood two houses and an office building.

Before firing of the test shot, newly completed Hildebrand Dam, a concrete structure 1 mi downstream that replaces Dam No. 12, was closed. The river backed up until the water level was 3 ft over the crest.

On the afternoon of the test shot, the question uppermost in the minds of everyone on the job was: Would the 700 lb of Nitramon S fired in the east end trigger the entire 415-ft dam length already loaded and primed?

A swimmer tied the Primacord leaders from each charge into the main circuit, which separated the test firing into three sections. Two Primacord MS connectors, MS-9 and MS-17, delayed the sections.

A tugboat pulled the barge clear, and all persons were evacuated to a distance of about 1/5 mi. Then, the warning whistle blew, and the 700-lb shot kicked up a compact column of water. The contractor breathed a sigh of relief. There was no blast propagation. The Nitramon in the two adjacent sections, even though primed, had proved insensitive.

The next two sections were fired on ensuing days. Blocked holes proved an increasingly troublesome problem, and fragmentation at the base of the dam was not satisfactory in several places. In addition, a number of loadings past the actual area of firing were lost by overbreak at the ends of the blast sections.

Because concussion and throw had been controlled so well throughout the work so far, Burnbrae elected to demolish the 350-ft river wall and the remaining 32-ft section of the dam in a single shot. This plan would save time and do away with the problem of overbreak.

To overcome the difficulty of blocked holes in the final shot, the blasting crew placed Pelletol in the bottom 3 ft of the blast holes before inserting the Nitramon columns. Pelletol is a free running blasting agent consisting of smooth round pellets of explosive about ¼ in. in dia. It is highly water resistant. The pellets filled the voids in the partially blocked holes.

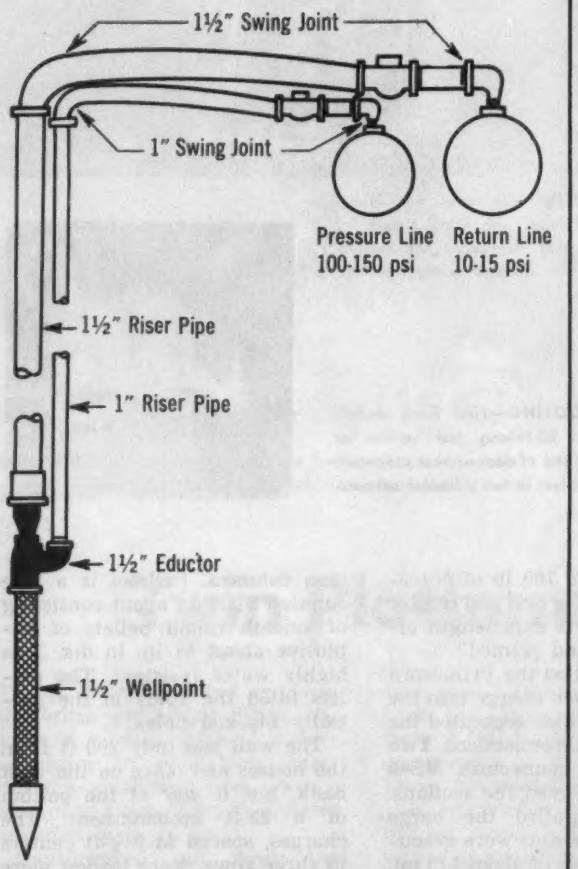
The wall was only 200 ft from the houses and office on the west bank, but it was at the bottom of a 25-ft embankment. The charges, spaced at 3½-ft centers in three rows, were loaded more heavily on the river side to throw debris away from the structures.

Workmen placed deck loadings of Nitramon in the bore holes penetrating the 37-ft-high wall and connected the charges to a Primacord firing circuit. When the shot went off, 7,300 lb of Nitramon S and Pelletol conclusively fractured more than 6,000 yd of condemned concrete. Fly towards the buildings on the bank was minor.

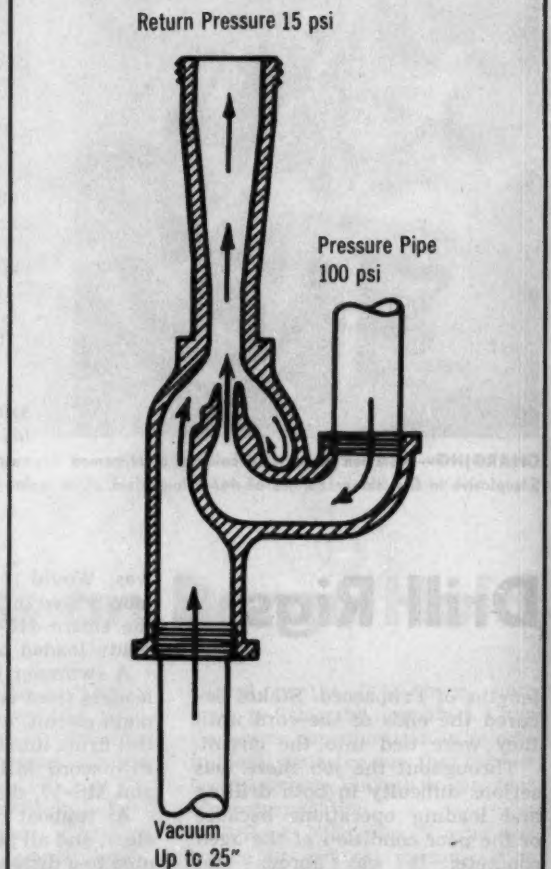
Big Chunks Shattered

Some of the debris from the first three shots required secondary blasting—a hangover from the blocked bore holes that prevented deep charge placement. Skin divers worked out a routine to handle this job. Working in 20-ft of water, they placed 25-lb charges of 60% high velocity blasting gelatine on each submerged fragment to be shattered.

Burnbrae used 11,000 lb of Nitramon S and 300 lb of Pelletol in all to demolish the dam. Prime contractor for the Corps of Engineers was American Demolition, Pittsburgh.



TWO LINE SYSTEM—Eductor system requires two header lines. One feed high pressure water to eductor; the other is a return line.



EDUCTOR—High pressure water passing through nozzle creates high vacuum (Venturi principle) that pulls in ground water.

Subway Contractor Tries New

A new idea in dewatering, the eductor type wellpoint, enables a New York subway contractor to dewater a trench 76 ft deep with a single-stage system.

A NEW SYSTEM of dewatering, making its first full-scale construction appearance on a large subway job in New York City, is attracting a lot of attention.

The system uses eductors rather than conventional suction wellpoints. Water under pressure passes through a nozzle at the wellpoint to create a vacuum that can dewater down to 100 ft in a single-stage system.

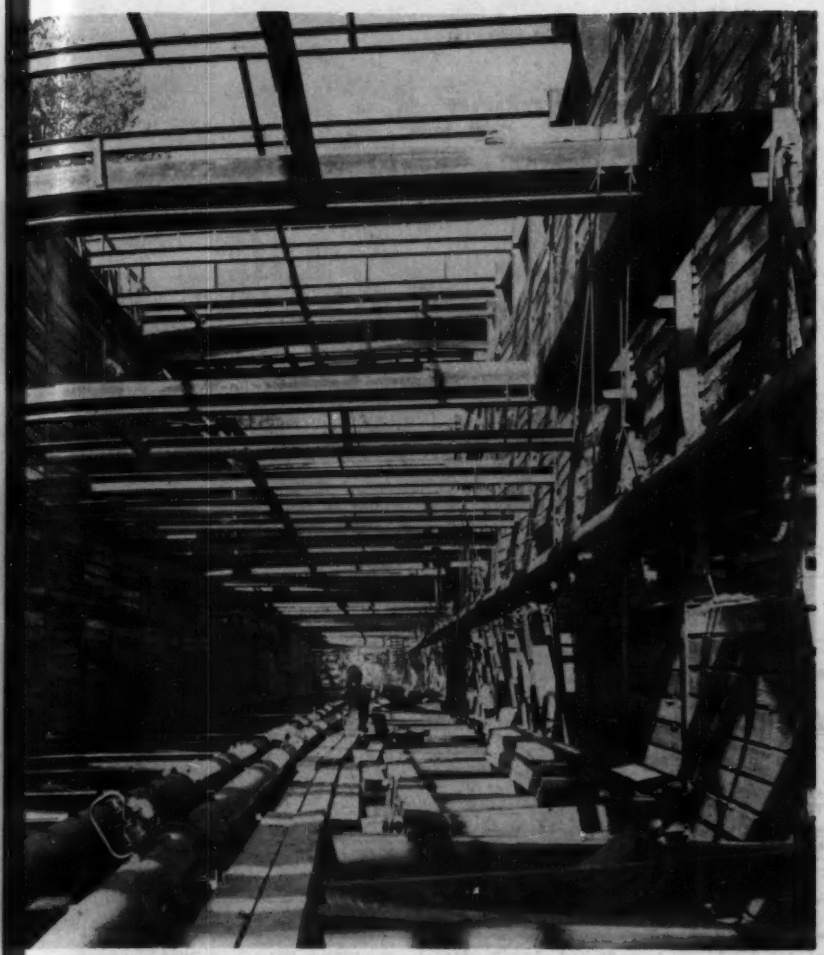
The job is the Chrystie St. subway relocation, New York's first major subway relocation since 1936. Cayuga Foundation Corporation of New York has a $9.2-million contract with the New York Transit Authority to construct 1,350 ft of subway line.

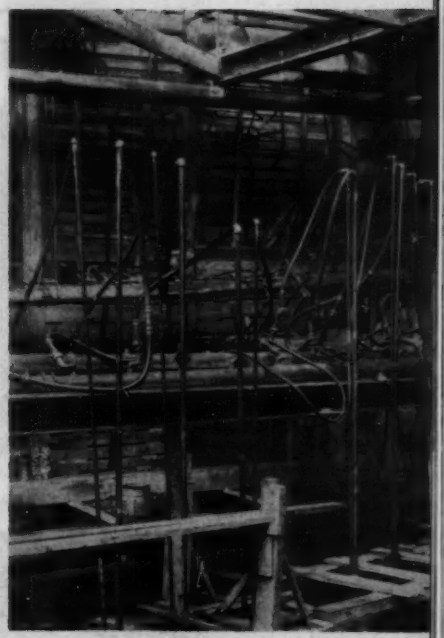
Cayuga's contract (Section No. 2) is only one phase of the overall project, but it probably is the most interesting part because of the 75-ft-deep trench required and the congestion in the area.

Depth and congestion were the principal reasons why the contractor had to hunt for a new dewatering system. To dewater 75 ft below street level would have required three stages in a convential wellpoint system. But because of the shortage of space at the site, there was no room for offsets in the trench excavation to provide working space for the pump stations.

It was a difficult situation. Looking around for a solution, Cayuga's President Dan Lazar and Vice President George Schuster, heard about a new type of dewatering system, the eductor, then being tried out in a small way on the construction of the Crown Zellerbach building in San Francisco.

The two men hopped a plane to California to see the eductor work. Satisfied that it could solve their





FOR THE SUBWAY CUT—Twin header pipes pass along right wall of excavation at Chrystie St. (left). Just under pipe trench sheeting has been moved back to provide space for individual eductor pipes. In the deepest part of the excavation (above), eductors are in middle of trench.

Dewatering System

own dewatering problems, they returned to New York and arranged for the Griffin Wellpoint Corporation to design an eductor system for the Chrystie St. job.

What Is it?

The eductor is relatively new to construction although it has been used for some time in other industries, like petroleum. It is based on the Venturi principle that water under pressure creates a partial vacuum when the size of the pipe through which it is flowing is reduced.

The eductor dewatering system consists of a pumping unit connected to two parallel header pipes. One header feeds water at high pressure into a series of smaller vertical down pipes leading to the eductor wellpoints.

The water flowing through a nozzle in the eductor creates a vacuum in the eductor. This causes ground water to flow into the wellpoint. Here it joins the pressure water and returns through a second riser pipe to the other main header.

The second header pipe collects the water and returns it to a vented storage tank at the pumping station. Here the excess water from the ground is piped off, and the rest of the water passes through a pump and is recirculated through the high pressure system.

The eductor system has several advantages over conventional wellpoints. First, it can develop a high vacuum at the wellpoint screen and can dewater depths as great as 100 ft in a single stage. Suction-type wellpoints are limited by atmospheric pressure to 20 to 25-ft lifts.

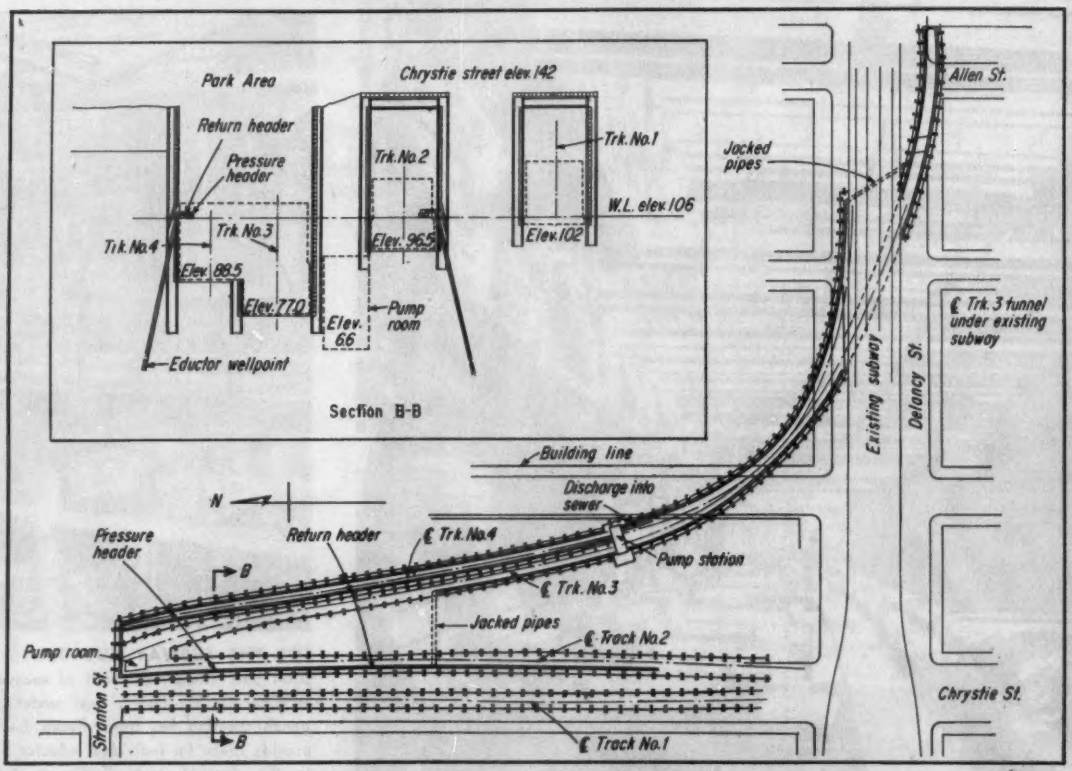
Second, air in the pipe does not affect the operation of the eductors. This often is a serious problem with suction wellpoints.

Third, eductors require very little adjustment. Also, they operate independently of one another; damage to one does not affect the rest of the system.

Of course, there are disadvantages to the eductor system, too. It takes a lot of power to operate the system. For every gallon of ground water pumped out, at least one gallon of pressure water must be pumped in. More often the ratio is 2:1 or even 3:1. Generally the efficiency decreases as the head increases.

Under the best conditions it takes more than twice as much power to operate an eductor

System Needs Only One Pump Station



JOB LAYOUT—Plan of job site shows layout of piping and central location of pump station. Where Tracks 1 and 2 diverge on Chrystie St. and where Track 3 crosses existing subway, connecting pipes are jacked. Cross-section view shows deepest part of excavation.

system as it does to run a conventional wellpoint system. At great depths the power factor may become prohibitive.

Another disadvantage is the presence of a high-pressure water line in the excavation. A broken line with water pressure at 124 psi can cause quite a mess in the cut. It could even cause a cave-in unless corrected in a hurry.

Soil Conditions

The ground at Chrystie St. strongly influenced the design of the dewatering system. Geologically, the soil is known as varved glacial lake deposit. It consists of thin alternating layers of silt, fine silty sand, and clay, representing annual deposits in an old glacial lake. This type of soil, often reaching depths of 100 ft or more, is common in New York City, contrary to the popular belief that bedrock in Manhattan always is only a few feet below the surface.

At Chrystie St., the top 10 ft is miscellaneous fill. Below this is 35 ft of coarse to fine sand and gravel. Under this is the glacial lake bed of silt and clay extending to bedrock 100 ft below street level.

The glacial deposits contain a number of strata of clay varying in thickness from 1/16 in. to 2 in. These layers are compressed and impervious to water. The result is that water flows much more freely in a horizontal direction than it does in a downward direction.

Because of this, the contractor had to put the wellpoints in sand wicks that carried all the water from the various strata down to the wellpoint.

The sheeting in the excavation was not designed to withstand hydrostatic head so the sand wicks had to be far enough outside the trench to intercept the water in each layer before it reached the sheeting. Also, the contractor wanted the eductors outside the trench to keep excavation at a minimum and provide clear working space inside.

They accomplished these objectives by progressively offsetting the horizontal boards in the sheeting for a vertical distance of about 3 ft at the depth they wanted to start the eductor pipes. This provided a sloping opening in the wall through which the eductor pipes could be driven at an angle.

Open-bottom, 12-in. steel casings were driven through the openings at a batter of 6:1. They were jetted down to a depth of about 45 ft.

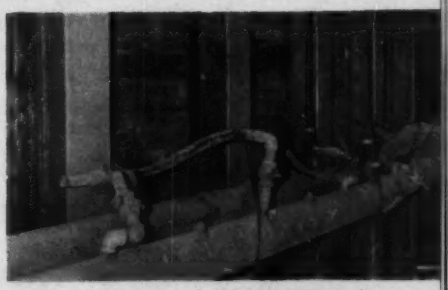
Then the casings were cleaned out, and the eductors inserted. The annular space in the casing was filled with sand, and the casing was removed. This formed the sand wick around the eductor.

Pumping System

Wellpoint Dewatering Corp., who held the dewatering contract, set up a single central pump sta-

PUMP STATION—Central pump station has three 125-hp pumps that can deliver 4,500 gpm at 150 psi. A 125-hp, 1,800-gpm standby pump is on hand in case of emergency.

STORAGE TANK—Return water comes to tank where ground water is piped off.



EDUCTORS—Closeup shows 1-in. and 1½-in. pipes connecting headers to eductor.

tion that contained four pumps.

Pressure water was circulated by three 125-hp Griffin pumps capable of delivering 4,500 gpm at 150 psi. A 200-hp standby pump was capable of delivering 1,800 gpm at the same pressure in case of a breakdown of one of the other pumps.

Header system consisted of 4,000 ft of 8, 10, and 12-in. pressure line and 4,000 ft of 8, 10, 12, and 16-in. return line. The pumps delivered water at more than 125 psi to maintain a pressure of 100 to 125 psi in the pressure line.

There were 650 eductors installed in the ground. Each was capable of pumping 10 gpm, but actual total output for the system never exceeded 1,500 gpm because of the nature of the soil.

The excess water was pumped into a storage tank at the pump station. From there it was discharged into a city sewer. For every gallon of water pumped out, two gallons circulated through the pressure system. At peak load this represented about 3,000 gpm circulating.

On the individual eductor lines, the pressure inlet pipe was 1 in. dia, and the outlet riser was 1½ in. dia.

Job Layout

The contract starts on Chrystie St. at the corner of Stanton St. where the four tracks are parallel, running north and south under Chrystie St.

Track No. 1 and Track No. 2 continue to run straight south along Chrystie St. for the extent of this contract. Tracks No. 3 and No. 4 curve off in an easterly direction and turn through 90 deg until they are parallel to and under Delancy St., which crosses Chrystie St. at right angles. The contract stops east of Allen St.

The excavation is deepest at the Stanton St. end. Track No. 3 at this point is 66 ft below street level and 31 ft below ground water table. Beneath Track No. 2 there is a 25x20-ft pump room that is 76 ft below the street and 40 ft below the water table. The eductor system lowered the water level a full 40 ft at this point.

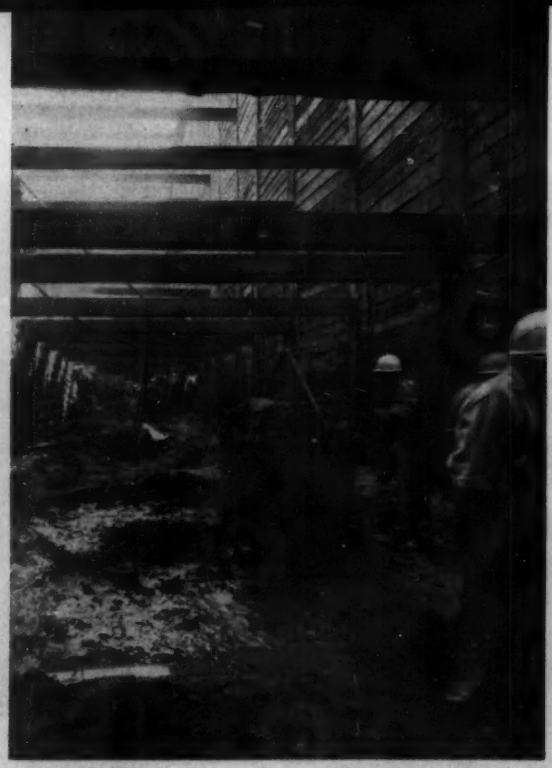
As the tracks move south they rise gradually, except for one point where Track No. 3 crosses under an existing subway. It is about 18 ft below the water table at that point.

The pump station was located about midway along the long curve of Tracks 3 and 4. This was fairly close to the center of the job.

At two points, main sections of track diverge from one another. One point is on Chrystie St. where Tracks 1 and 2 diverge from 3 and 4. The second point is on Delancy St. where Track No. 3 goes on one side of the existing subway and Track 4 goes on the other.

continued on next page

TEMPORARY ROADWAY—Workmen prepare 24-in. H-beams and 12x12 timbers for roadway to carry traffic over trench excavation.



MUCKING—Men fill crane bucket by hand. Excavating is slow process because of old foundations and buried concrete conduits.

At both points the dewatering systems along the respective tracks were connected by 12-in. pipes jacked through the original ground from one line to the other. This shortened the length of the header system considerably and kept it within the capacity of one pump station.

Also, in the second case, it was more convenient to jack the pipe under a new section of ground than to carry it through the new tunnel. Extensive underpinning was needed for 150 ft as the new tunnel passed under the old, and this reduced working space in the tunnel. All the rest of the job was in open cut where there was room for cranes to install the pipes.

Header pipes ran along about the elevation of the water table, 35 ft below the street. The openings in the trench sheeting were made at this elevation. Eductors were spaced at about 5-ft intervals on the average, closer in the deep sections.

Trench Shoring

Cayuga decided to handle almost all of the work in open cuts. To brace the sides of the trench they drove 24WF130 soldier beams every 10 ft and reinforced them with heavy cross-lot bracing. Average length of the soldier beams was 65 ft.

This may be the first time that such heavy piles have been used for temporary shoring. Cayuga had some trouble at first driving them. They tried several hammers, including a diesel hammer, before they found that a McKiernan-Terry S8 would handle the job. They mounted the hammer on a Manitowoc 3000 crane with 100-ft leads.

Breastboarding was 4 in. or 6 in. depending on the depth. It was not designed to withstand hydrostatic head. But it did hold back the earth and served as a wall form during the concreting of the tunnels.

When the open cut crossed a street, Cayuga had to maintain a normal flow of traffic. They built temporary roadways over the cut with 24-in. H-beams at 10-ft centers covered with a deck made of 12x12-in. timbers.

Cayuga used high tensile bolts for the connections between the soldier beams and the cross beams in the roadway. This is another possible first—few contractors have considered high tensile bolts for temporary steel work.

Difficult Job

Although the dewatering system is the first thing that catches your eye on this job, there also are a number of other difficult problems that Cayuga has had to cope with.

The excavation passed close to 20 buildings, all of which had to be underpinned. Cayuga subcontracted this work to Spencer, White & Prentis of New York.

It cost Cayuga $250,000 to relocate telephone lines and 83 service ducts. Gas lines had to be run overhead temporarily during the excavation.

Excavation was especially tough. Cayuga never knew what they were going to run into next. They had to cut through the foundations of three old buildings. Worse than that was an old 6x8-ft utilities conduit with reinforced concrete walls 1 ft thick, ceiling 16 in. thick, and steel rails cast into the floor for reinforcing.

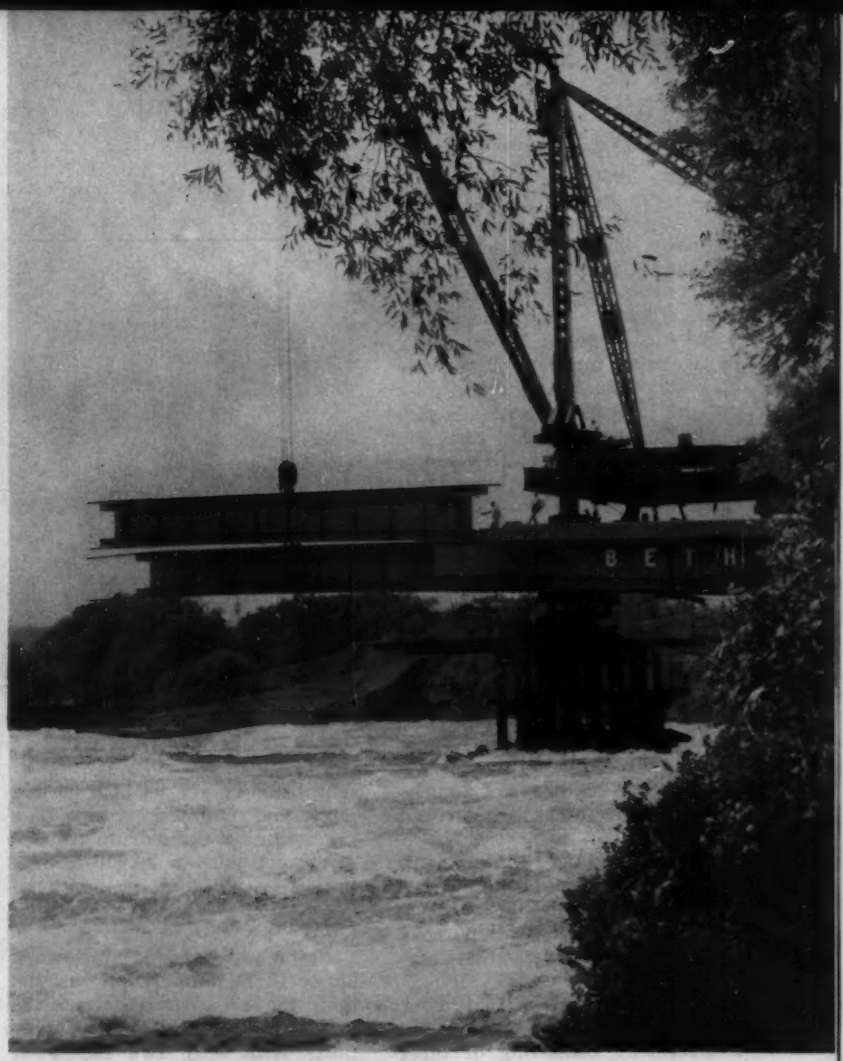
All this was considered earth excavation. Cayuga's bid price for general excavation was $15 per cu yd. In the congested areas they figured they were having a good day when they removed 30 cu yd.

For Cayuga, Vice President George Schuster is the general superintendent, Karel Von Reusen is project manager, and Lee Crosby is superintendent.

Samuel Freedman is resident engineer for the Transit Authority. Nathan Brodkin is chief engineer, and Harry Newman is division engineer.

Charles McKee and Vincent Cummings were in charge of dewatering for Wellpoint Dewatering Corp., the contracting arm of Griffin Wellpoint Corp.

To erect the longest plate girder span in the United States, Bethlehem Steel Co. had to build falsework in some of the roughest, fastest rapids in the country. They made it stay put by weighing it down with pig iron and anchoring it to the banks on each side.



Steelmen Beat Niagara River

ERECTION WORK is nearly complete on the longest plate girder span in the U.S. The bridge will span the Niagara River near Niagara Falls. Bethlehem Steel Co. started work on the bridge in the spring of 1959. They expect to have it opened to traffic this November.

From a construction point of view there are several interesting aspects to the job.

To start with, the main span is a clear 450 ft from abutment to abutment—the longest continuous plate girder span in the Western Hemisphere. To complicate things, erection crews have to do the entire job from one bank. This calls for more falsework in the river than would be needed for a normal cantilever erection from two banks.

There may be tougher rivers in the world to put falsework in, but there can't be very many. The bridge spans the most turbulent part of the American Rapids in the Niagara River, just a few hundred feet above Niagara Falls. The current is extremely fast and the bottom is rocky and uneven.

The bridge, known as the American Rapids Bridge, is part of the overall development at Niagara by the Power Authority of the State of New York. It will link the city of Niagara Falls with Goat Island and will open the island for development of recreational facilities. Bethlehem Steel Co. has a $1.6-million contract with the Power Authority to build the bridge and its approaches.

Spanning the River

The only existing access to Goat Island is an old masonry arch bridge located downstream from the site of the new bridge. Load limit on this bridge is 10 tons so Bethlehem could not get any of their heavy equipment or main bridge members across it to the island.

They handled the erection completely from the mainland bank by cantilevering out from the bank over a series of falsework piers until they reached Goat Island. They completed the main girder crossing early in September. But right at the beginning of the job they had to make contact with the island in order to set up a safety net across the river.

This safety net, called for in the specifications, extends right across the river under the bridge. It is carried on two main cables that span the river.

continued on next page

To get the cables in place, Bethlehem adopted the rather dramatic scheme of flying a kite across the river to make the initial contact. The men on the job made the kite. After several unsuccessful flights and some fancy footwork on the part of the kite operators on the main shore, they got the line across to the island.

Starting with a nylon cord, the men on the island hauled across a manila rope, then a ⅜-in. steel cable and finally the 1-in. steel cables for the net.

Starting the Erection

The first stage in the erection sequence was to put up one of the three short land spans on the mainland side. Two of these are 60-ft simple beam spans with beams ranging in size from 24WF100 to 33WF130. These spans will carry bridge traffic over the two roadways of a parkway system now being built along the river.

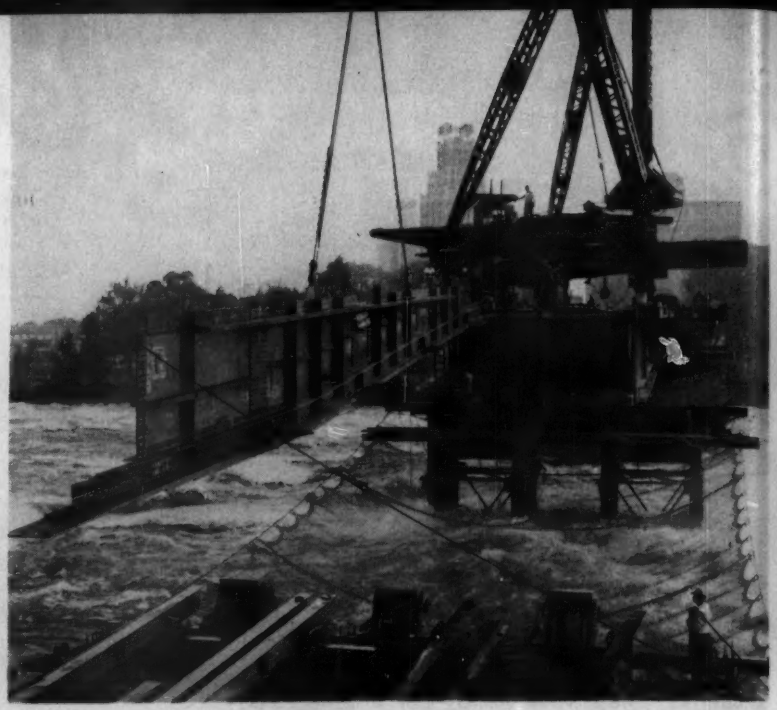
The third land section is a 3,000-ton steel and concrete anchor span that is designed to counterbalance the main span and provide for deflections under traffic.

The anchor span is 70 ft long, 44 ft wide, and 16 ft deep. It has a steel core consisting of three heavy built-up plate girders that connect to the three girders of the main span. Forming a solid block around the girders is 1,500-cu yd of poured-in-place concrete. Additional steel reinforcing in the anchors is provided by 6-in. I-beams in the top part and 12-in. I-beams in the lower section.

An 80-ton Lima crawler crane handled the erection and concrete work on these three spans. For the concrete anchor block, the contractor built plywood forms with timber walers along the sides. They drilled holes through the webs of the girders and passed tie rods right through the pour to tie the walers together. They supported the anchor girders on a falsework grillage during the erection.

Then the Lima assembled a traveling stiffleg derrick on top of the completed anchor span. The derrick handled the rest of the erection.

Capacity of the traveler is 85 tons. It has a 105-ft boom and 20-ft jib. Sills are of unequal lengths; they are set at a 60-deg angle and mounted on rails. The rig mounts a three-drum American hoist with a 20,000-lb line pull.



SAFETY NET—To protect men working on bridge, safety nets are suspended under the working area. Two steel cables stretching from shore to shore carry the nets.

Falsework

Bethlehem needed falsework supports at four points as the main girders advanced across the gap. They obtained the four supports with only two falsework bents. Each bent was set up in one position and later was leapfrogged forward to a second position.

Each bent contained two 12x14-ft cages set at 24 ft between centers. The cages consisted of steel piles set in a bracing frame that also served as a templet to position the piles for driving.

The first bent, 46 ft from the mainland abutment, had a pile in each of the four corners of each cage—a total of eight piles in the bent. The second bent, 105 ft nearer the middle of the river, had two rows of five piles in each cage, or a total of 20 piles in the bent.

The third bent, using the cage from the then dismantled first bent, also contained 20 piles and was located 245 ft from the mainland abutment. The fourth bent was similar to the first and was set up 101 ft from the island abutment.

The piles were 14WF87 sections, 20 to 28 ft long. They were tied together at the top with 12-ft-long 27WF145 beams running transversely to the bridge. The beams were bolted to heavy seat angles on the piles and carried the full construction load of the bridge. The horizontal members of the pile cage only braced the piles; they carried none of the bridge loads.

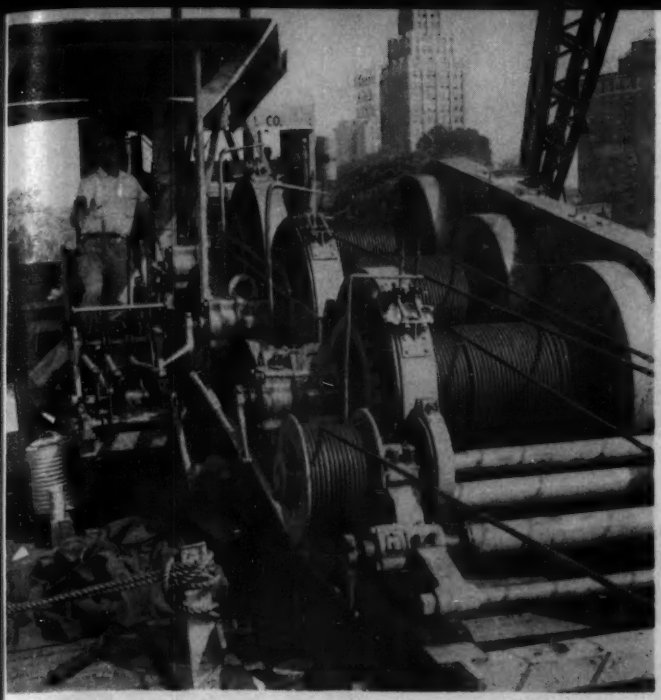
Across these beams went two 14WF320 distribution beams 16 ft long running parallel to the bridge. Transversely across the distribution beams were two 36WF321 sections 40 ft long. These beams carried 500-ton hydraulic jacks to position the bridge girders at proper elevation. After the jacks had done their work, a grillage was inserted under the girders, and the jacks were removed.

Placing the Falsework

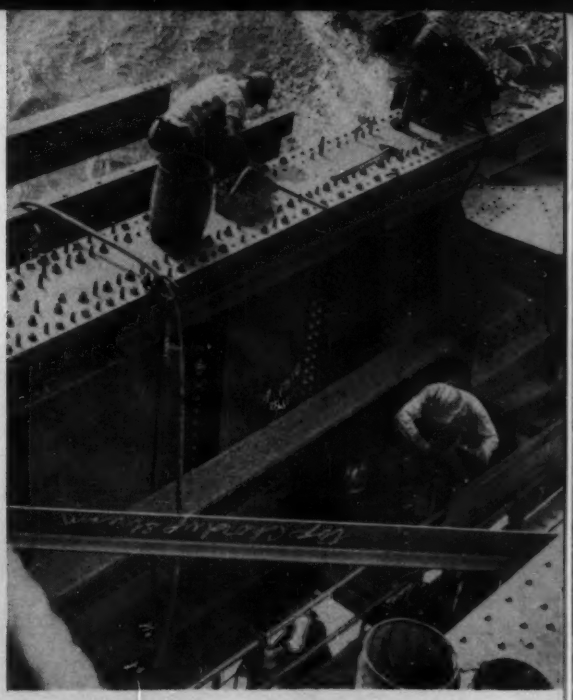
First step in the erection of a falsework bent was to take soundings at the designated location for the bent. The traveler lowered into the stream a steel H-beam marked off in feet to measure the approximate depth of the water at each corner of the pile cage. Depths varied from 2 to 8 ft, sometimes from one pile to the next.

The corner piles were bolted into the cage on land and the whole assembly lowered into the river. When the cage was sitting on the bottom, crews made final adjustments in the corner pile positions to level the assembly.

When the corner piles of the heavier cages were in position,



TRAVELER HOIST—Three-drum hoist with 20,000-lb line pull powers the traveler. Hoist is manufactured by American Hoist & Derrick Co.



CONNECTIONS—Men on top of girder connect splice with high strength bolts. The men below are using rivets.

the traveler placed and drove the interior piles. The corner piles were driven last.

A Vulcan No. 2 air-powered hammer mounted on the traveler handled the driving. It drove the piles until the resistance was 10-12 blows per in. Normally penetration was about 6 in. into the rock, but in some softer spots piles penetrated as much as 18 in. Each pile was fitted with a special rock tip.

For the light bents in the inshore positions, the weight of the bent itself plus the penetration of the piles into the rock was enough to resist the force of the current. But in the midstream positions, even the 20-pile bents were not heavy enough to stand up against the current.

Bethlehem took two extra steps to stabilize the center bents against the river. They weighed down each cage in the bents with two 8-ton ingots of pig iron. And they anchored the bents with cables to hoist on shore.

For the first midstream position, they set one hoist about 500 ft upstream on the mainland side of the river. The hoist had two drums and a line pull of 4,000 lb. Two cables, each with two parts of ⅝-in. rope extended directly to the bent. The cable dragged in the water for part of the distance, and the force of the current was so great that it bowed the cable nearly 100 ft out of line.

For the second midstream bent, Bethlehem mounted a similar hoist on Goat Island and connected the bent to hoists on both shores.

Main Erection

The traveler extended the main girders outward one section at a time. It erected falsework bents ahead of the main girders and removed the bents behind as soon as the weight was taken off them.

The haunch girders on the mainland side were 91 ft long, 14 ft deep and weighed 116 tons each. Bethlehem erected them in two horizontal halves weighing 58 tons each.

The girder sections get thinner

CLOSING THE GAP—Crew completes bracing on last section of main span. Next they will position steel for the anchor span that is attached to the ends of the girders.

MATERIAL BUGGY—Buggy rides on rails set on two of the main girders. Lima crane on shore places steel on buggy. Buggy then rolls out to where traveler picks up steel.

LAND SPANS—Steel for one of two simple girder spans on shore has been erected. Spans will carry bridge traffic over new parkway. Hoist on span moves material buggy.

toward the center of the bridge; depth of the girder is only 7 ft at midpoint. The original design called for a 112-ft center piece to be placed. This piece would have weighed 76 tons. Bethlehem erected this member in two 56-ft long, 38-ton halves and field-spliced them in the middle.

All the splices in the main girders were designed for side entry during erection. This type of joint is easier to fabricate, and it also means that the traveler does not have to reach out so far to position the members.

The Lima crawler crane on the mainland fed the steel up to the bridge level and placed it on a buggy. The buggy hauled it out to the traveler.

The buggy was 11 ft wide and 20 ft long. It ran on rails set on the upstream and middle girders. This let it get in close to the traveler, whose rails were set on the two outside girders. An American, two-drum hoist with a 7,000-lb line pull moved the buggy. The hoist was located above the mainland abutment and moved the buggy forward or backward with two ⅝-in. steel cables.

ANCHOR STEEL—Three heavy girders form the core of the concrete anchor span.

Safety Net

The safety net is supported on two 1-in. cables that stretch from anchorages at the piers on each side of the river. The cables are 50 ft apart, 6 ft wider than the bridge.

A series of 32x50-ft nets are hung across the cables and fastened to the cables with shackles so they will slide. The net is made of ½-in. manila rope in 4-in. square mesh.

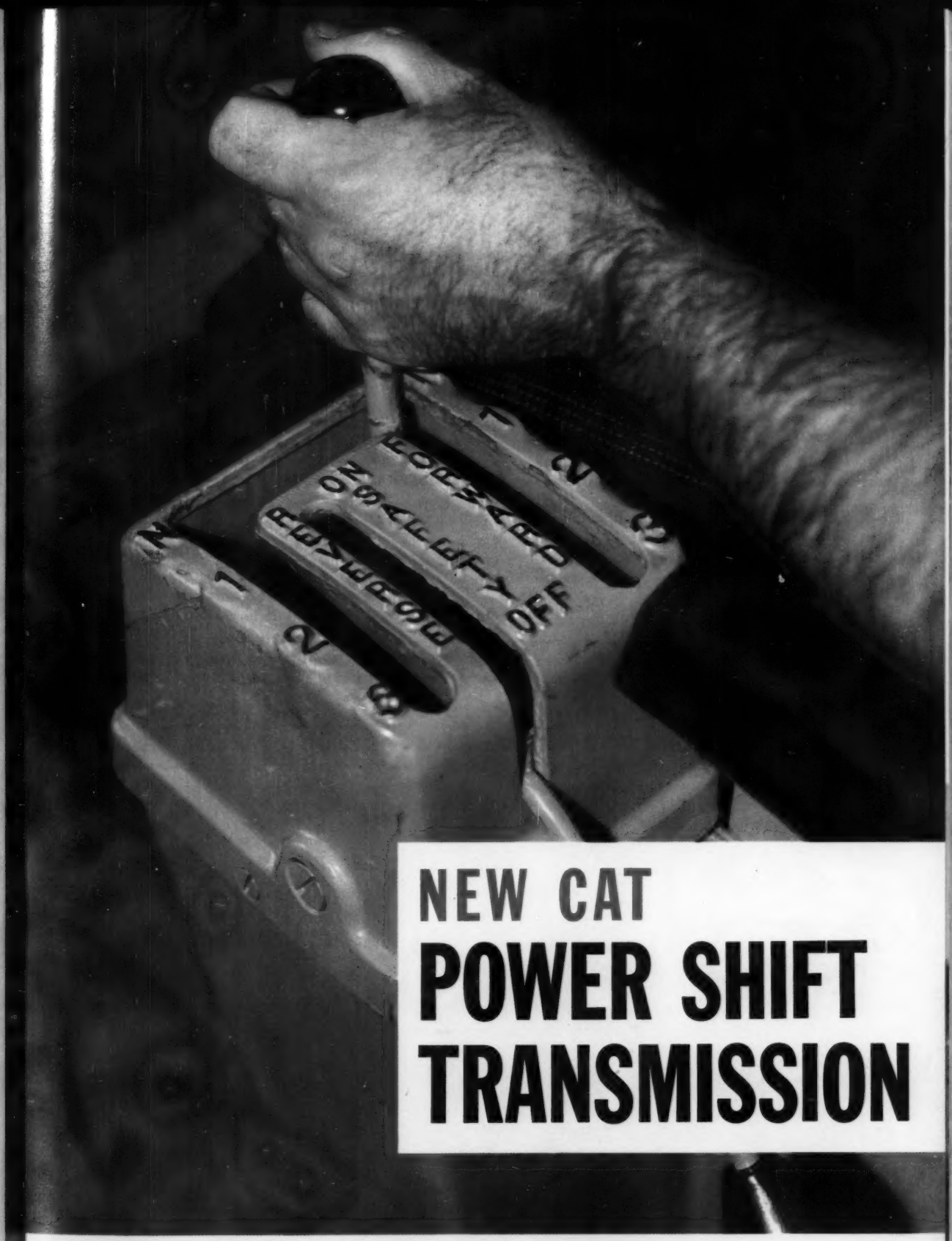
At every panel point, or at approximately 23-ft spacing, a 50-ft steel beam is fastened across the bridge with saddles for the net cables. These beams take the sag out of the cables.

Men on the Job

The Pittsburgh Erection District of Bethlehem Steel has the prime contract for the bridge. G. B. Shaw, Jr., is manager of the district. Ervin W. Slockbower is project manager for the job. Harry Hiscott is superintendent. Engineers on the job are Ernie Heisten and William Barton.

Praeger & Kavanagh of New York are consulting engineers for the New York Power Authority. Their resident engineer on the job is Ira Hoyt.

Subcontractors on the job include Johnston Bldg. Co. of Niagara Falls, who are building the foundations, and Booth & Flinn of Pittsburgh, who are handling the roadwork.



NEW CAT POWER SHIFT TRANSMISSION

CATERPILLAR'S **No. 1** PROJECT

PAYS OFF FOR YOU AGAIN! A multimillion-dollar research program—to meet the continuing challenge of the greatest construction era in history with the most productive earthmoving machines ever developed.

NEW POWER SHIFT TRANSMISSION for CAT D9 and D8 TRACTORS

Shifts on-the-go under full load in a split-second! ■ Changes speed reverses direction with finger-tip control lever—and no clutching!

The wraps are off—it's ready. After many years of research and on-the-job testing, Caterpillar now offers a revolutionary new transmission option for Cat D9 and D8 Tractors—power shift. The most recent Caterpillar new product development, this new transmission—with an exclusive design—provides production highs never before possible with a track-type tractor. Here's why:

1. It combines for the *first* time the flexibility and anti-stall features of torque converter with the operating snap of direct drive. And because of its direct drive characteristics, it is more efficient than other power shift designs.

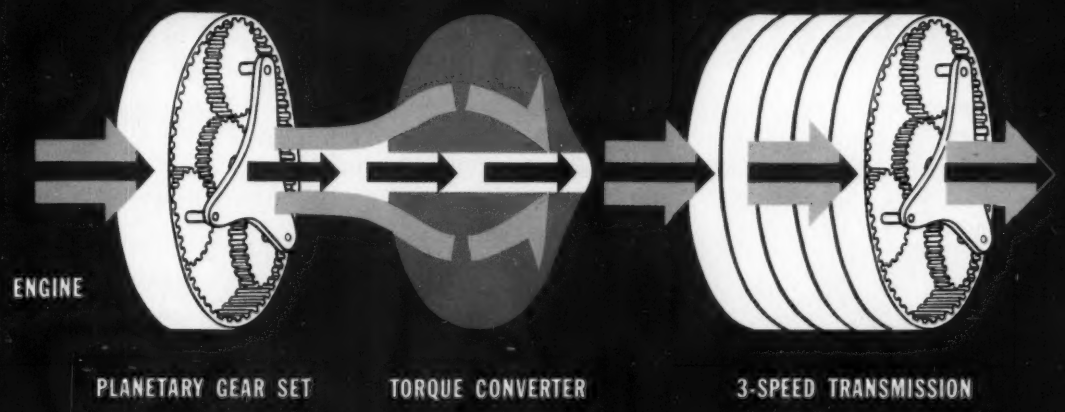
2. With one control lever and no clutching, it reverses direction . . . changes speed . . . smoothly . . . under full load . . . in a fraction of a second!

Talk about productivity—Cat power shift delivers in a big way. Split-second, on-the-go shifts give plenty of power in the highest gear possible. Shifting is so easy the operator just naturally gets more work out of the tractor. What's more, he gets it on the toughest, most demanding track-type jobs. Cat power shift design is strong and rugged for the *heaviest earthmoving duty*.

Get the details about this power shift from your Caterpillar Dealer. Ask for a demonstration—see for yourself how it steps up production. Remember, you also have your choice of direct drive or torque converter in the D9 or D8. Whatever the application, Caterpillar has the most productive machine for it!

HIGHER PRODUCTION PUSHLOADING: *Power is quickly, easily adjusted to meet the demand. Shifting to higher gear boosts scraper out of cut at higher speed, increases production. Speedy reverse quickly positions machine for next push*

CAT POWER SHIFT TRANSMISSION



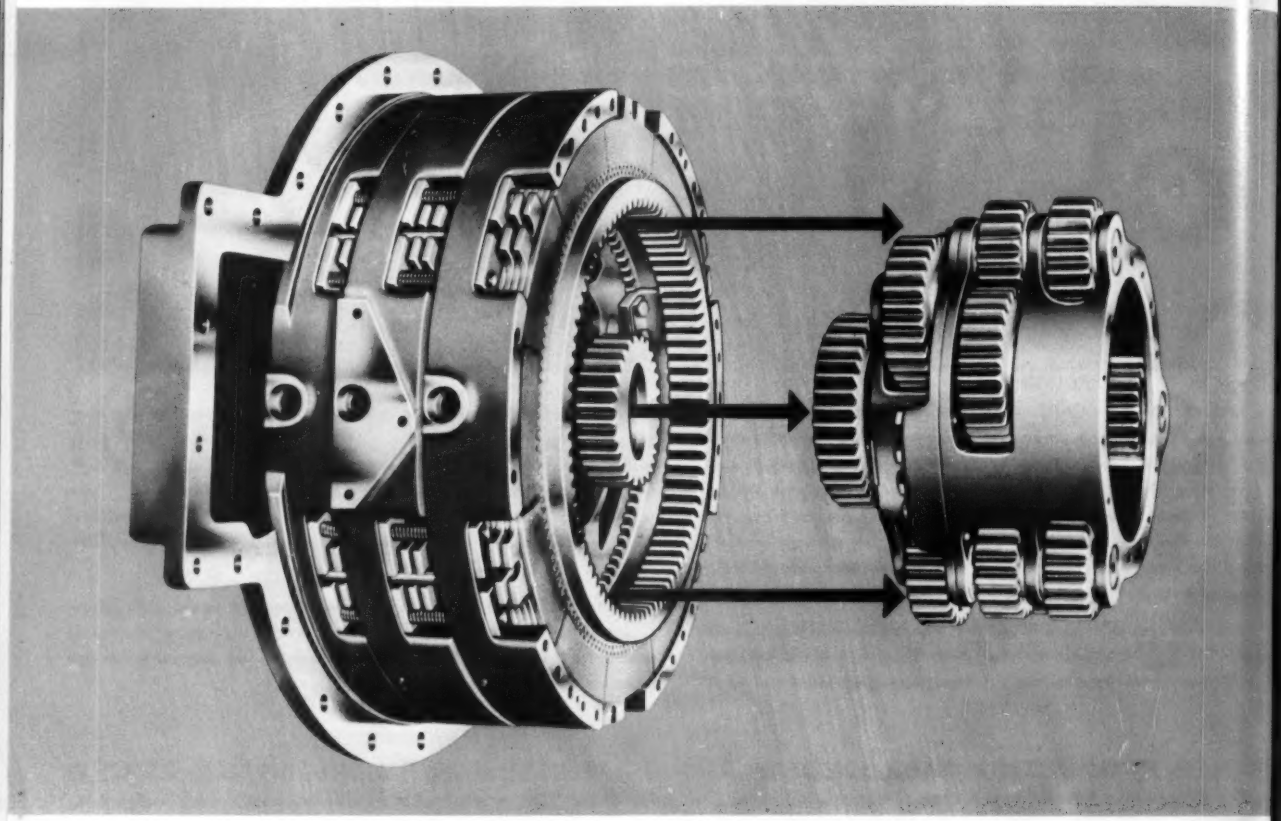
BASIC DESIGN: Total power is transmitted from the engine to a planetary gear arrangement mounted in the engine flywheel. The planetary divides and directs the total power—part goes through a direct drive shaft straight to the transmission and the remainder through a torque converter to the transmission. This enables the Cat power shift to combine some of the efficiency and the positive operating feel of direct drive with the anti-stall and flexibility features of torque converter drive.

Power shift control is mounted to the left of the operator (see previous pages). One selector lever (black knob) eliminates gearshift, forward-reverse and flywheel clutch levers. The safety lever (red knob) prevents accidental transmission engagement. The selector lever moves in a "U" path to various positions. To the left are three reverse speeds. To the right, three forward speeds. To change speed, simply move lever to the required position. To change travel direction, move lever to the opposite side. Changing speed and direction are as easy as that—without clutching—and changes can be made while the machine is in motion under full load without loss of power.

Pioneered by Caterpillar, this uniquely designed power shift is engineered and built for heavy earthmoving service—it's rugged! The transmission itself weighs over one ton! And its clean, unit construction design makes it easy to service, when required.

HIGHER PRODUCTION BULLDOZING: *As the material builds up, Cat power shift permits split-second, on-the-go shifting. There's no forward surge when the load is dropped. Instant reversing further slashes cycle time on a bulldozing assignment.*

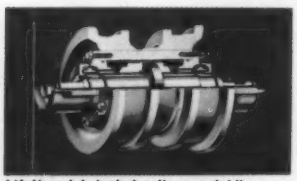
ONE TON OF RUGGEDNESS



—CAT POWER SHIFT TRANSMISSION!

You're looking at a portion of the components that make up the new Cat power shift transmission. This rugged transmission, weighing over a ton, is designed and built specifically by Caterpillar for its giant tractors. Every component is constructed for long-lived service. Selected alloy steel insures performance that stands up under the toughest conditions. Equally important, Cat power shift comes to you thoroughly tested by exacting design and demanding field work in the heaviest earthmoving duty. You can be sure that it will stay on the job.

In fact, every feature of D9 and D8 Tractors is specifically designed and built to keep these machines working *profitably* for you. For example, lifetime lubricated track rollers never require further lubrication until rebuilding. They feature Caterpillar-developed, *exclusive* floating-ring seals that assure constant, positive sealing. These seals—plus a rugged design featuring bushing-type bearings and deep hardenable alloy rims—plus 2½ million test hours—make Caterpillar rollers ready for the toughest jobs.



Lifetime lubricated rollers and idlers—one of many other rugged features of Cat D9 and D8 Tractors.

In short, nothing has been overlooked to make these modern, heavy-duty machines the most practical and most productive in their class in the field.

For complete facts on the new Cat power shift see your Caterpillar Dealer. He's ready to explain in detail how the Cat power shift works, or to demonstrate its ruggedness . . . its ease of operation . . . its productivity. Name the date—he'll demonstrate!

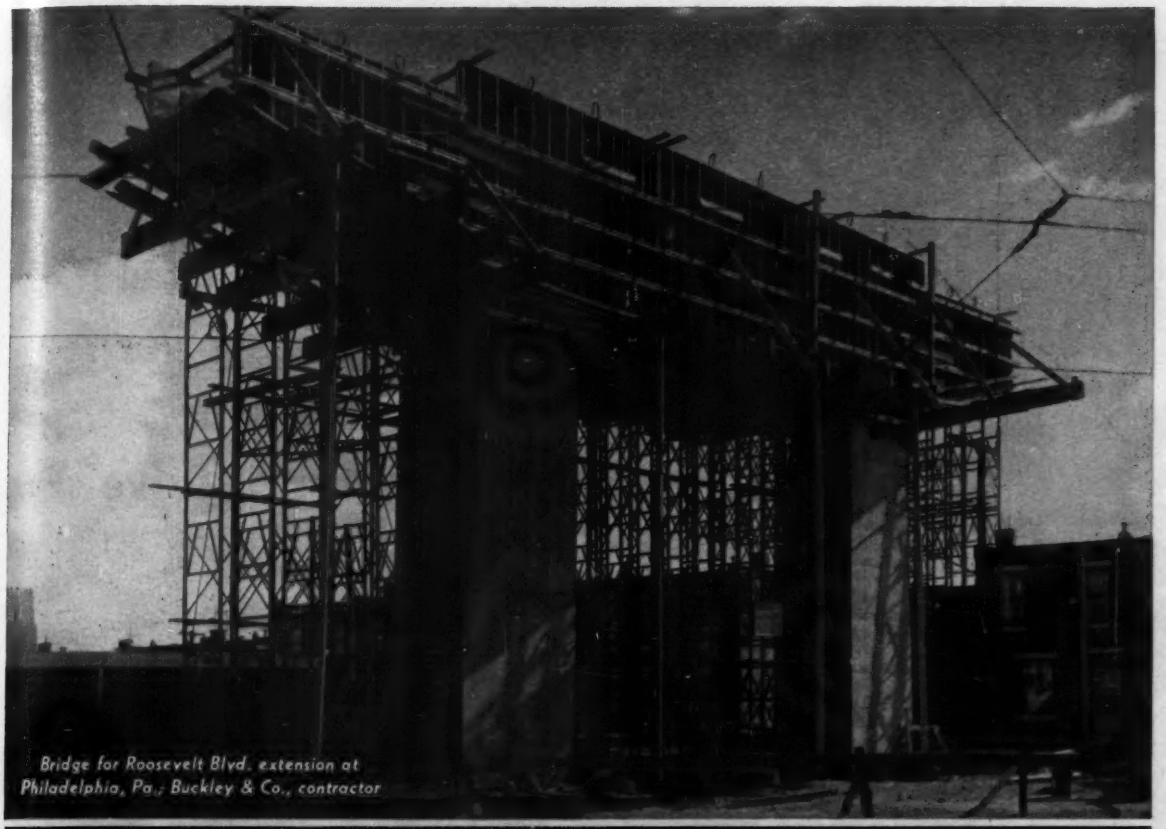
Caterpillar Tractor Co., Peoria, Ill.; San Francisco, Calif., U. S. A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

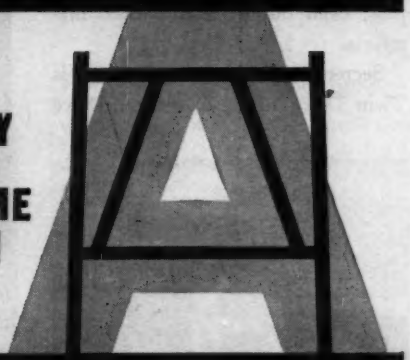
BORN OF RESEARCH
PROVED IN THE FIELD



Bridge for Roosevelt Blvd. extension at Philadelphia, Pa.; Buckley & Co., contractor

SAFWAY HEAVY-DUTY SHORING

ONLY SAFWAY HAS THE A-FRAME DESIGN

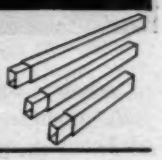


1 Safe leg load capacity—10,000 lbs. each (total frame capacity—20,000 lbs.). 3:1 safety factor.

2 Safway's A-frame construction gives you that desired lateral stability plus a high load bearing top member.

3 Three frame sizes, with jacks, will meet all job height requirements.

4 Telescoping hollow steel ledgers available in three workable lengths. (Equal to 4 x 12 lumber.)

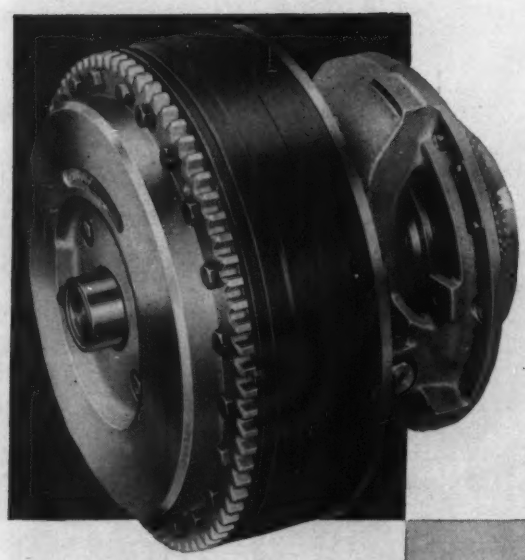


5 Design capacities of Safway's heavy-duty shore frame are maintained on extreme height requirements.

CONSULT WITH SAFWAY ENGINEERS ON YOUR SHORING JOB
Nation-wide branch and dealer locations for planning and erection service. Sale or rental.

WRITE TODAY FOR BULLETIN 1110A SAFWAY

SAFWAY STEEL PRODUCTS, INC., 6228 W. STATE ST., MILWAUKEE 13, WIS.



CASE

"420" Industrial Loader gets more push-power for faster digging with Torque Converter Drive

For a machine that weighs only 7,120 lbs., the Case "420" Industrial Loader packs a lot of power. It's billed as the only low-priced wheel type loader actually designed for production digging assignments. With 12,000 lbs. drawbar pull and 4,600 lbs. break-out force, the 15 cu. ft. bucket gets heaping loads on every pass, even out of hard-packed materials.

Secret of this amazing power is Twin Disc Torque Converter Drive

. . standard equipment on the Case '420." Compared to direct mechanical drives, the torque converter provides up to 56% greater push-power at the all-important working speeds.

As the load increases, torque output is multiplied through an infinite number of speed ratios to overcome load resistance smoothly and automatically. Since the engine is not lugged down, the 21-gpm hydraulic pump delivers full break-out power at all times. No tractive effort is lost due to tire slippage, because the slippage occurs within the torque converter.

In addition to boosting power, the torque converter's fluid cushion absorbs shock loads to prevent damage to engine and power train. There's no need for clutching during the digging operation, so operator efficiency goes up while the problem of clutch wear and replacement disappears.

Add all these features together and you get this answer: More dirt moved in less time and with far less effort. A test of the Case "420" Front-End Loader will convince you that Twin Disc Torque Converter Drive belongs on all your earthmoving equipment.

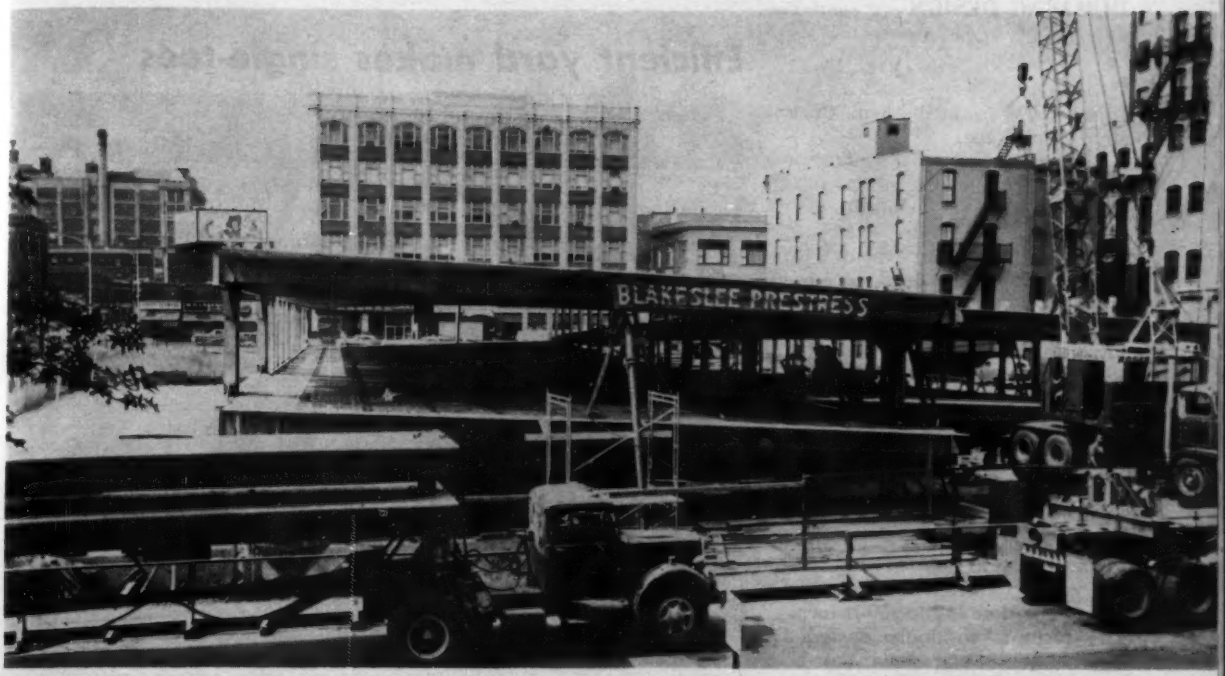
TWIN DISC

TWIN DISC

Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

BRANCHES OR SALES ENGINEERING OFFICES: CLEVELAND • DALLAS • LOS ANGELES • NEWARK • NEW ORLEANS



SLANTED RAMPS—Differing elevations of beam seats on the columns give the ramps a warped look. This is the center 55-ft bay of a 165 x 208-ft garage for 350 cars, which customers will park themselves. Traffic through continuous ramped garage is all one way.

New Building Design Requires Special Techniques

Costing only $4.80 per sq ft to build, a parking garage is a series of ramps made of 55-ft prestressed single-tee beams 8 ft wide, 2 ft deep.

END SECTIONS—Steel girders, 27-in. deep and weighing 114 lb per ft, support the single-tee beams above the 30-ft drive-through openings between bays of sloping ramps.

AN UNUSUAL building design often demands unusual structural members. And when these members are prestressed concrete, the contractor making them must often devise unusual casting techniques.

A case in point is the 350-car parking garage for Forbes & Wallace department store in Springfield, Mass. Gage & Martinson, New York engineers, designed the self-parking facility as a continuous series of gently sloping ramps with one-way traffic entering at one end and leaving at the other.

Their unusual design called for three parallel 55-ft-wide bays 208 ft long. And it specified 55-ft-long prestressed concrete single-tee beams, 8 ft wide yet only 2 ft deep, to span the bays. The single-tees act as horizontal bracing and also form the ramps. Flange thickness varies from 1½ in. at the

edges to 7½ in. at the 8-in. thick stem of the tee.

Springfield general contractor Ley Construction Co. sublet fabrication and erection of the single-tees to C. W. Blakeslee & Sons, Inc., New Haven contractors. In all 182 of the members were required.

Blakeslee designed its own forms and had them fabricated from 7-gage steel plate. Welded triangular steel gussets on 30-in. centers and longitudinal ¼ x 3-in. strips on 20-in. centers reinforce the plate. To prevent the unusual single-tee shape from tipping, steel posts, on 8-ft longitudinal centers support the flange edges to the concrete floor of the casting yard. Six single-tees can be cast at one time in the 330-ft form. The form is so finely designed and made that it need not be sprung for stripping the tees despite their vertically sided stems.

The single-tee beams contain eighteen 7/16-in. prestressing strands, in six layers of three each. These are pretensioned near the bottom of the stem, with 2 in. between layers. The lower three layers remain straight. But later the upper three layers are draped. This is done by pushing them down at beam midpoint and raising them at the ends until there is about 12 in. between nearest straight and draped layers.

After unreeling the strands and stretching them the length of the bed, Blakeslee stresses the strands individually. A Europa gripping chuck holds one end of the strand. At the other end, a Rodgers hydraulic jack with a Chatillon dynamometer stretches it to a load of 19,000 lb. (Blakeslee considers this more accurate than the usual method of stretching to a predetermined strand elongation.)

After stressing all strands, the draping operation takes place. For this, Blakeslee fitted the casting line with anchored steel yokes across the forms at beam midpoints and with removable steel posts between members.

First, at each beam midpoint, a short horizontal pipe with four steel fingers welded to the bottom is placed transversely over the three lines of strands, like a comb. Fitting into the top of the pipe is a greased, tapered steel shaft (salvaged the next day for reuse) that attaches to the yoke's transverse member. The weight of this member and shaft, with an assist from a compression block handled by a Travelift, pushes the upper nine prestressing wires down. They are deflected until they are touching and resting on top of the straight strands. Then the yoke's transverse member is pinned to its side arms.

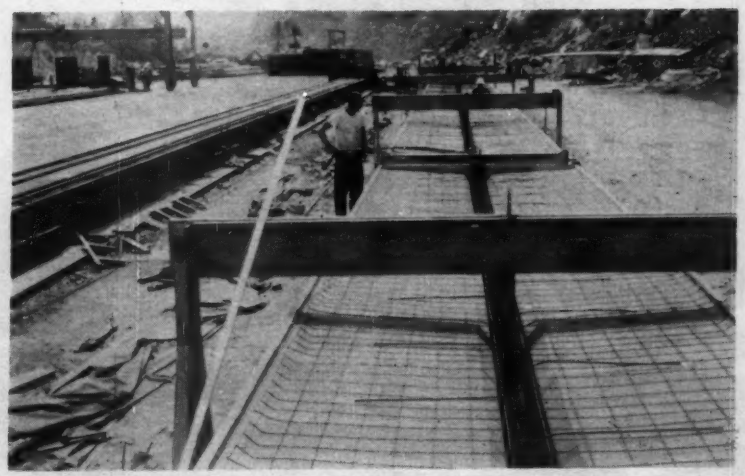
Maximum depression of the deflected strand is about 5 in. This requires a load of about 1 ton.

Next, strands are plucked up at the ends of the tees. The templets holding the strands at the bed ends are raised to final position first, and pinned in place. Then a Travelift, handling a steel yoke fitted with hardened steel pins, lifts up the strands between tees—a 5½ ton load. Twin columns are placed astride the raised strands, and a horizontal steel comb is inserted between them to hold the strands and free the Travelift.

Upon completion of the strand deflection operation, the ordinary bar and mesh reinforcing for the flange is placed, bulkhead forms inserted, and concrete poured.

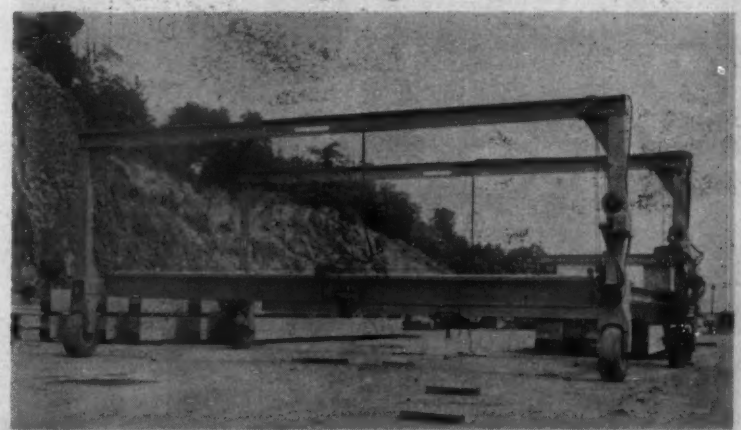
Concrete, which reaches a strength of 4,000 psi after an overnight steam cure and 6,000 psi in 28 days, is made with high-

Efficient yard makes single-tees



STRAND HOLD-DOWN—Half of the eighteen 7/16-in prestressing strands are draped. Salvagable steel shafts from yokes across the forms hold them down at beam midpoint.

Revamped lifting rig works better



BEFORE CONVERSION—Originally, Travelift was fitted with transverse carry-beams that were raised to lift the load, which was hooked directly to the beam's trolley.

CONCRETE PLACER—Contractor fitted a conveyor to an old truck rear end to place transit-mixed concrete in 8-ft-wide form.

STEEL SCREED—A channel fitted with a vibrator smoothes the concrete after it is placed by the conveyor and internally vibrated.

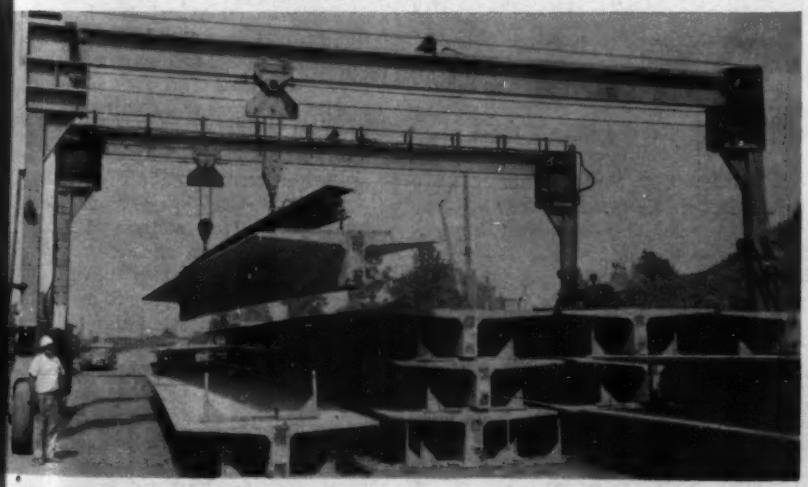
early-strength cement and Norlite coarse aggregate. It is mixed in transit from a Blakeslee batch plant some miles away and placed in the forms by belt conveyor.

Blakeslee assembled this unit in their shop. They took an old truck rear end and mounted an American conveyor on it. They fitted it with hydraulic cylinders and a hand-operated pump to raise, lower, or swing the conveyor. And they added a towing tongue to the axle and fitted it with a hitch from a Gradall bucket. All the transit-mix truck has to do is back into the automatic hitch, then drive along the casting line, towing the conveyor as it transfers concrete from truck to form.

In the form, Mall vibrators consolidate the mix internally, and a Cleveland vibrator on a steel screed smooths the top. Then a wire rope is stretched above the center line of the poured units and tarpaulins draped over it. Low-pressure live steam from a Cleaver-Brooks 125-hp generator is introduced under the tarps for an overnight cure.

Next morning, tarps and strand deflectors are removed and the strands cut between beams. Then the 10-ton tees are removed to storage by a Travelift.

continued on next page



AFTER CONVERSION—Carry-beams have been welded in place of gantry's top member, and the load is now handled much more easily through blocks suspended from the trolley.

THE PAYOFF—After careful casting and curing, graceful single-tees are erected. A single crew can place 15 of the 8 x 55-ft units in a day, making 6,600 sq ft of ramp.

The Busiest Tool You'll Ever Own!

Construction and building users are highly enthusiastic over this time-saving . . . labor-saving . . . money-saving . . . man-saving device. Does hundreds of jobs Faster . . . Easier . . . Safer! Automatic let-down feature permits one man to lower 3000 lbs., one notch at a time with safety.

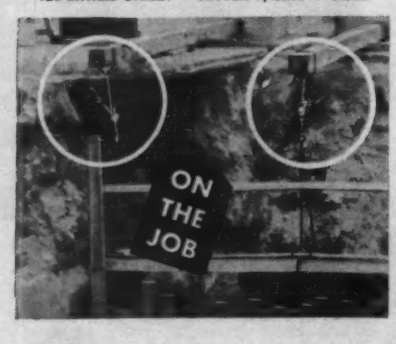
Steel frame, stress parts of high tensile manganese bronze, preformed aircraft cable.

- Set Forms
- Pull Motors
- Erect Towers
- Pull Vehicles
- Load Materials
- Rig Scaffolding
- Hoist Platforms
- Stretch Guy Wires

Tested To 50% Overload

1½ Ton Model Shown

Ask Your Jobber or Write to
THE AMERICAN GAGE & MANUFACTURING CO.
128 BAYARD STREET • DAYTON 1, OHIO • U.S.A.



FOUNDATION CONSTRUCTION—Instead of excavating entire site, general contractor dug trenches so he could pour all basement walls by gravity from transit-mix trucks.

But this unit is like no other Travelift, for Blakeslee has modified it drastically.

Originally developed for handling boats, the rig is essentially a self-propelled gantry frame spanning 42 ft. It is powered by hydraulic motors and is capable of 5-mph speeds and 25-ton lifts. Before Blakeslee went to work on the machine, it was fitted with two transverse carry-beams that were moved bodily up or down by cables to raise or lower the load. Trolley blocks on the carry-beams provided lateral positioning.

This operation was slow. The blocks were not adjustable, so that many different length chokers were necessary. The transverse carry-beams limited vertical clearance and also prevented reaching down between stacks of stored tees for loading out.

In modifying the Travelift, Blakeslee cut off the top transverse members of the gantry frame. They replaced them with the carry-beams, welded to the gantry legs through heavy knee bracing. They fitted each trolley with a set of blocks. And they rerigged the unit so the drums and cables that originally operated the carry-beams now operate the load blocks. Finally, they beefed-up the hydraulic system.

In addition to moving the single-tees from form to storage, the Travelift loads them on pole-type semi-trailers for the 65-mi trip to the erection site. There, Lorain and Link Belt Speeder truck cranes set them in place on column seats at the rate of 15 per day per crew.

This ends Blakeslee's work. But later the single-tee ramps are paved with 3 in. of 3,500-lb lightweight concrete reinforced by 6 x 6 No. 6 mesh.

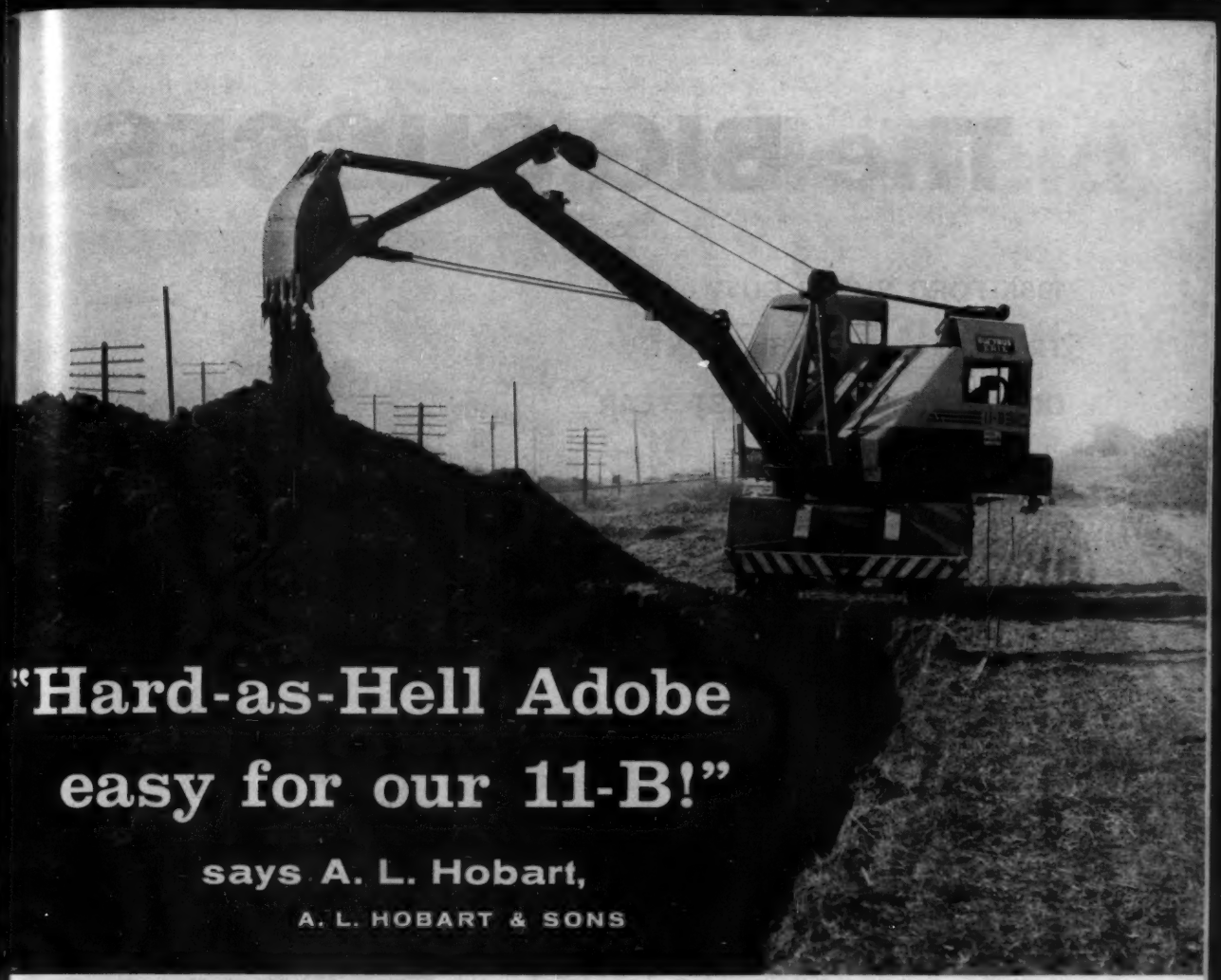
Cost of the 350 car, 165 x 208-ft parking garage is only $4.80 per sq ft. And this includes a sprinkler system and exceptionally bright lighting. It also includes cost of an 11-ft basement that is part of the ramped parking area.

Main reason for the low cost, of course, is the design incorporating the continuous ramp of single-tees. But Ley Construction Co. helped keep costs down right at the start of the job with an unusual foundation technique.

The original site was a paved parking lot at street level. And the foundation for the garage was to consist of a cantilever exterior perimeter wall and two interior walls on spread footings, all brought up approximately to street level.

Rather than excavate the site completely, Ley just excavated trenches for the walls and footings by backhoe and clamshell. This accomplished two things: It permitted short bracing to be used to hold wall forms, and it let transit-mix trucks chute concrete directly into forms. Upon completion of walls, the rest of the excavation was taken out.

Harry Palmbaum is general manager of Blakeslee's prestressing operation. Bob Studley is in charge of Ley's job.



"Hard-as-Hell Adobe easy for our 11-B!"

says A. L. Hobart,

A. L. HOBART & SONS

Hobart averaged 200 lineal feet of 12-ft-deep, 5½-ft-wide trench every 8-hr shift on this pipeline relocation job near Walnut, California, digging in "hard-as-hell adobe!"

Hobart's reaction to the new Bucyrus-Erie 11-B is typical, and here are more reasons why:

The 11-B hoe has the extra range owners have needed so long — digs 17 feet down . . . reaches out 26 feet, 9 inches to put dirt farther away from the trench, loads trucks easily, makes fewer moves per day.

The 11-B's exclusive, variable pitch dipper action gives you as much as 10% more level floor, changes the pitch of the dipper continually as you dig.

Easy to maintain? The 11-B has more time- and energy-saving maintenance features than any other crane in its class, including a color-guide lube system, automatic gear lubrication, pre-lubricated ball bearing swing circle with nothing to adjust, no bushings to replace.

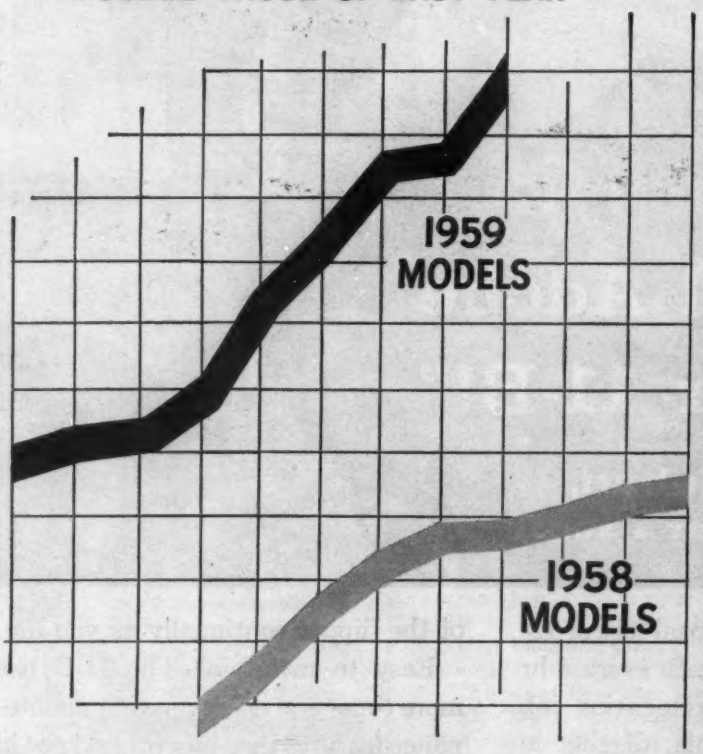
Get the complete 11-B story from your distributor, or write Bucyrus-Erie Company, South Milwaukee, Wisconsin, Dept. 22-EB

BUCYRUS ERIE®

Builds Better Equipment

The BIG SUCCESS o

1959 FORD SUPER DUTY TRUCK SALES MORE THAN DOUBLE THOSE OF LAST YEAR



1960 FORD SUPER DUTIES

SKYROCKETING SALES OFFER ADDED TESTIMONY TO THE TOUGHNESS AND RELIABILITY OF FORD "BIG V'S"— *NOW* THEY'RE MORE DURABLE, MORE FLEXIBLE THAN EVER!

Ford's increase in sales of Super Duty Trucks, while impressive in itself, by no means tells the whole story. Over half of the 1959 unit sales were the result of repeat orders from operators like Trucking Contractors, Inc., who bought because the Ford "Big V" provided the kind of performance and durability needed for their work.

And for 1960, the Ford Super Duties offer additional refinements designed to provide an even greater degree of dependability. Bigger optional axles and increased GVW's permit greater payloads and more profitable operation. Automatic radiator shutters to keep the engine temperatures within the most efficient operating range, submerged-type electric fuel pump to prevent vapor lock, and redesigned wiring for longer, more dependable operation are but a few of the improvements which add to the performance and durability of these units.

The changes offered for 1960 we tested and evaluated by Americ foremost independent automoti research organization. The certifi results of the studies by this in partial firm (name available o request) provide proof that Ford Super Duty Trucks are even mo dependable.

- **Certified Durability through clos temperature control!** Independe research engineers certify that Ford thermostatically controlled radiat shutters kept water temperatu between 168° and 188° in seve mountain grade operation. The te truck with shutters blocked op

of the Big Truck Field

"Tried 8 in '58—bought 20 more in 1959," says Curtis E. Brost, President, Trucking Contractors, Inc. "In 1958 we bought 8 Ford T-850's with lightweight chassis options and specially built 5-batch bodies which gave us a full extra batch per truck. A 5-batch load is a real strain on the truck when you consider we're 'running the ditches' on this highway paving job in North Dakota. These T-850's worked out so well that we ordered 20 more in '59. Our Ford Tandems with the 477 engine give us good mileage and the drivers are real happy with them. It's a rough go on trucks with soft footing and dust so bad we have to drive with headlights on. Despite such operating conditions, downtime has been negligible and these '477' Fords have given us less trouble than other trucks we have operated."

with Certified Durability

under same operating conditions had a temperature range from 102° to 181°. The temperature variation of only 20° with shutters means less expansion and contraction in engine block and cylinder heads. Higher temperatures with radiator shutters permit leaner fuel-air mixtures with less possibility of raw gas washing down cylinder walls. Warm oil circulates more freely, reducing internal friction. All these factors contribute to longer engine life.

Certified Dependability with longer-lived electrical system! Ford's '60 improved wiring harness and the 1959 wiring harness were subjected to shaker table tests plus constant exposure to oil and water vapors and temperatures of 200°. Certified results prove that the greater resistance to deterioration by heat, oil, water and abrasion obtained with the 1960 wiring harness more than doubles wiring harness life.

- **Certified Reliability with Ford's submerged-type electric fuel pump!** Dynamometer tests of engines with submerged-type electric fuel pump and conventional mechanical type showed that vapor lock was non-existent with Ford's electric pumps at temperatures up to 200°, whereas incipient vapor lock with mechanical pump resulted in a power loss of 9% at an underhood temperature of 200°.

Test results like these plus the experience of satisfied users are important but that is not all. For 1960, the Super Duty line has been broadened to provide even more flexibility in power train options. Get the facts from your Ford Dealer!

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . BUILT TO LAST LONGER, TOO!

5 reasons why Atlas Copco's "TIGER" is best for stoping and all short-hole drilling!

(1) It's fast and easy to handle!

(2) It's easy collaring, with little recoil!

(3) Features a retractable air leg!

(4) Convenient controls, automatic back head!

(5) Operates on single air supply!

Here's the TIGER—a new, fast, compact rock drill with power and stamina to meet toughest drilling requirements! Its high percussion rate not only speeds penetration, but at the same time cuts recoil to a minimum. With controls conveniently located, collaring is unusually easy.

What's more, the automatic back head prevents dry collaring. Flushing water actually flows before drilling starts. And, the Tiger's "constant blowing" provision sends air through the machine the instant pressure is turned on, keeping water and cuttings from the rotation chuck.

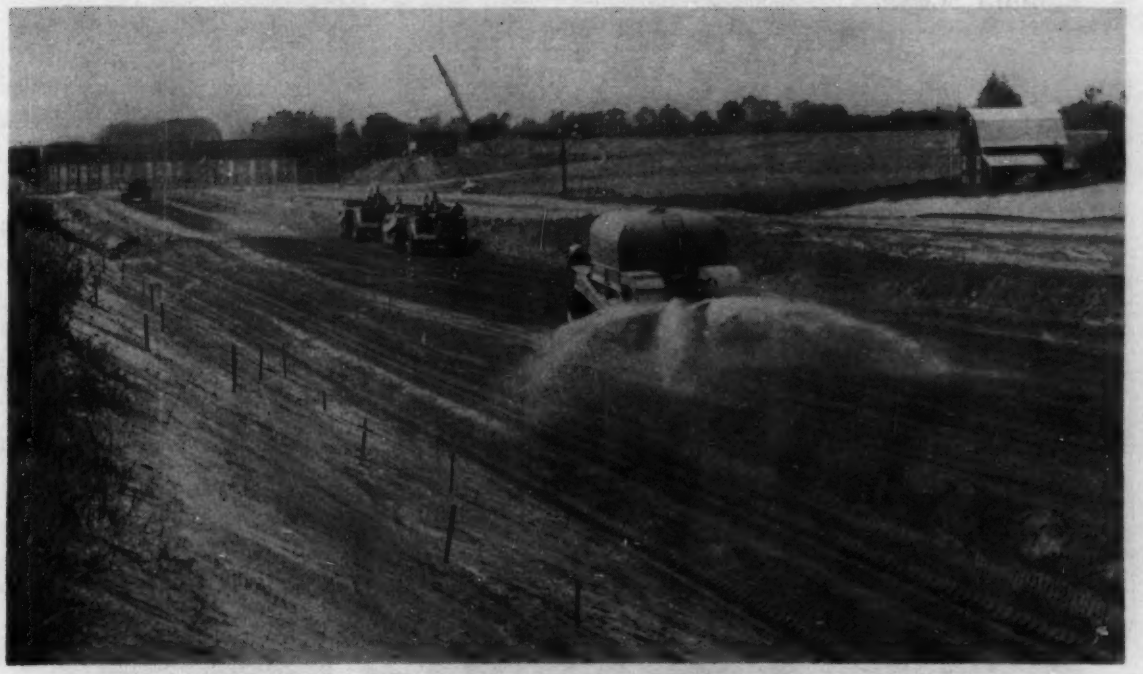
There's still another "plus"—the Tiger's exclusive integral type pusher leg, with retractable piston rod. Operates on a single air supply!

This isn't the whole story by any means. For more facts about the amazing new Tiger rock drill and how it can speed *your* drilling, call your nearest Atlas Copco representative. Or, write to us at Dept. CM-10.

Atlas Copco

610 Industrial Avenue
Paramus, New Jersey
COlfax 1-6800

930 Brittan Avenue
San Carlos, California
LYtell 1-0375



WATER WAGON—Converted Cat DW21 scraper wets down haul road. Marlow reversible pump, mounted on rear, provides pressure to fill tank and discharge spray.

Rebuilt Scraper Fits the Bill as Water Wagon

A SCRAPER converted to a water wagon is helping a Michigan contractor set a fast earthmoving pace on a section of the Detroit-Chicago Expressway.

Most of the earth is a Coloma series sand that can create dust problems, but loads well when it is wet. To provide water at a rapid rate, S. D. Solomon & Sons, Pontiac, Mich., converted a Caterpillar DW21 scraper into a water wagon with a pressurized 7,000-gal tank. It has electrical controls at the operator's seat.

A Marlow reversible pump, powered by a Ford industrial engine, is mounted on the rear in place of the ejector mechanism. The pump can fill the tank from water holes, fire hydrants, and other sources, or discharge water through four duck bills.

Solomon finds the modified scraper has distinct advantages. It can negotiate the same grades as the earthmovers. And, when it is not in use, the tractor can be unhitched and assigned to other jobs.

In addition, the conversion cost only $10,000—or about half the price of a new commercial water hauler. The contractor rebuilt one of his older scrapers with the aid of Michigan Tractor and Machinery Co., Caterpillan dealer in Detroit.

High Production

Solomon's production record is outstanding. The firm holds two contracts totaling $5 million to move 4,000,000 cu yd of earth along an 11.5-mi right-of-way in southwestern Michigan.

Solomon began working on a 6-mi section in August. In the first 10 days, a fleet of 18 scrapers and a crew of 70 men moved 353,000 cu yd, working an 11-hr day. They are averaging 32,000 cu yd daily over a hauling distance of 2,300 ft. The job is four months ahead of schedule.

Solomon began work on the other 5.5-mi section in December, 1958, and completed earthmoving in March—about nine months ahead of schedule. Here, the contractor used 10 Cat DW21s, averaging 17,000 yd over a hauling distance of 2,800 ft.

The two adjoining projects pass through flat country. Maximum cut is 31 ft, and maximum fill is 35 ft.

Solomon is clearing 100 acres along the 300-ft-wide right-of-

MUCKING—Three model 375 Link-Belt cranes with 1¾-yd draglines excavate muckhole. They removed 334,000 yd from seven muckholes along right-of-way and dug out two creeks.

way. Three Cat D9 tractors, four D8 dozers, a D6 with a root rake, and two Michigan rubber-tired dozers are handling this task on Saturdays. During the rest of the week, all but the D6 serve as push dozers.

Solomon has one other problem: a high water table. To master this situation, crews cut all drainage ditches in the fall and hauled borrow to the fill areas in the winter when the ground was frozen.

Three 1¾-yd Link-Belt draglines are excavating 334,000 yd from seven muck holes and digging out where box culverts will carry the road over two creeks along the right-of-way.

Haul roads on the job are maintained by a Cat No. 14 motor grader and two Austin-Western S999s and one M99.

Charlie and Otto Solomon are general superintendents. Elmer Huntsinger is earthmoving superintendent. D. W. Miller is engineer for the Michigan Highway Dept.

Greater Strength . . . Maximum Safety . . .

CROSBY-LAUGHLIN Load-Rated* TURNBUCKLES

guaranteed rated capacities

- **Stronger hooks . . . stronger eyes . . . stronger jaws**
- **Big hex ends make takeup easier, faster, safer**
- **Most complete range of sizes**
- **100% Drop forged . . . Weldless**

Write for free specifications catalog listing the most complete line of drop forged fittings for wire rope and chain.

Stocked by leading distributors everywhere.

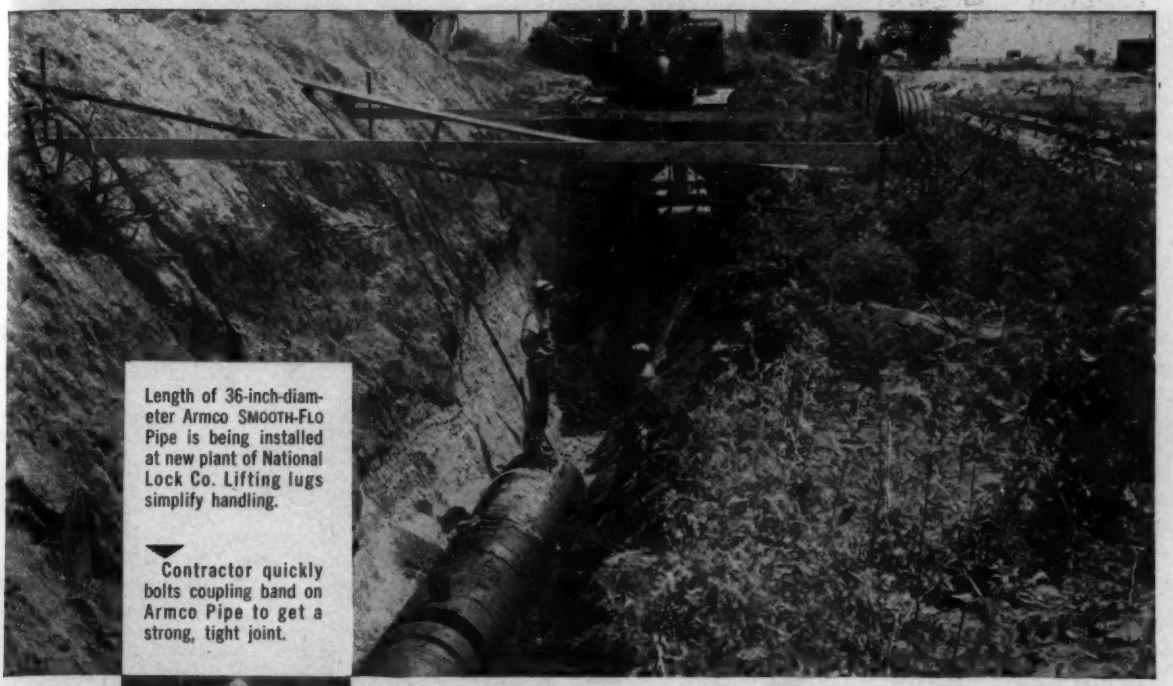
CROSBY-LAUGHLIN *Division*

AMERICAN HOIST & DERRICK COMPANY

FT. WAYNE, INDIANA

Manufacturers of Crosby Clips and "Load-Rated" Blocks . . . Crosby-Laughlin "Load-Rated" Fittings . . . Lebus Load Binders and Snatchblocks.

*Trademark



Length of 36-inch-diameter Armco SMOOTH-FLO Pipe is being installed at new plant of National Lock Co. Lifting lugs simplify handling.

Contractor quickly bolts coupling band on Armco Pipe to get a strong, tight joint.

CONTRACTOR SAYS

"Long lengths and ease of joining Armco pipe made for good time"

This was the comment of Edwin Hogan & Sons, Rockford, Illinois, contractors who installed 3,750 feet of Armco Corrugated Metal Drainage Structures for the new Fastener Division plant of National Lock Co., Rockford.

The job was to provide a storm drainage system for the 632,000 square-foot structure. More than half of the Armco Pipe installed was Armco SMOOTH-FLO®, in diameters from 24 to 36 inches. Remainder was smaller diameter asphalt-coated Armco Pipe.

Principal advantage of Armco SMOOTH-FLO is its high flow capacity, an important factor in this installation. For example, most of the 36-inch diameter pipe was on a relatively flat slope of 2 inches per 100 feet.

The pipe was supplied in 20-foot lengths. Lugs, fastened to the pipe exterior, permitted quick attachment of wire rope slings, and simplified pipe positioning.

For data on Armco Drainage Structures, send coupon. Armco Drainage & Metal Products, Inc., 4619 Curtis Street, Middletown, Ohio. In Canada: Guelph, Ontario.

ARMCO DRAINAGE & METAL PRODUCTS, INC.
4619 Curtis Street, Middletown, Ohio

☐ Send new, concise data on Armco Drainage Structures
☐ Send new, FREE "Installation Manual"

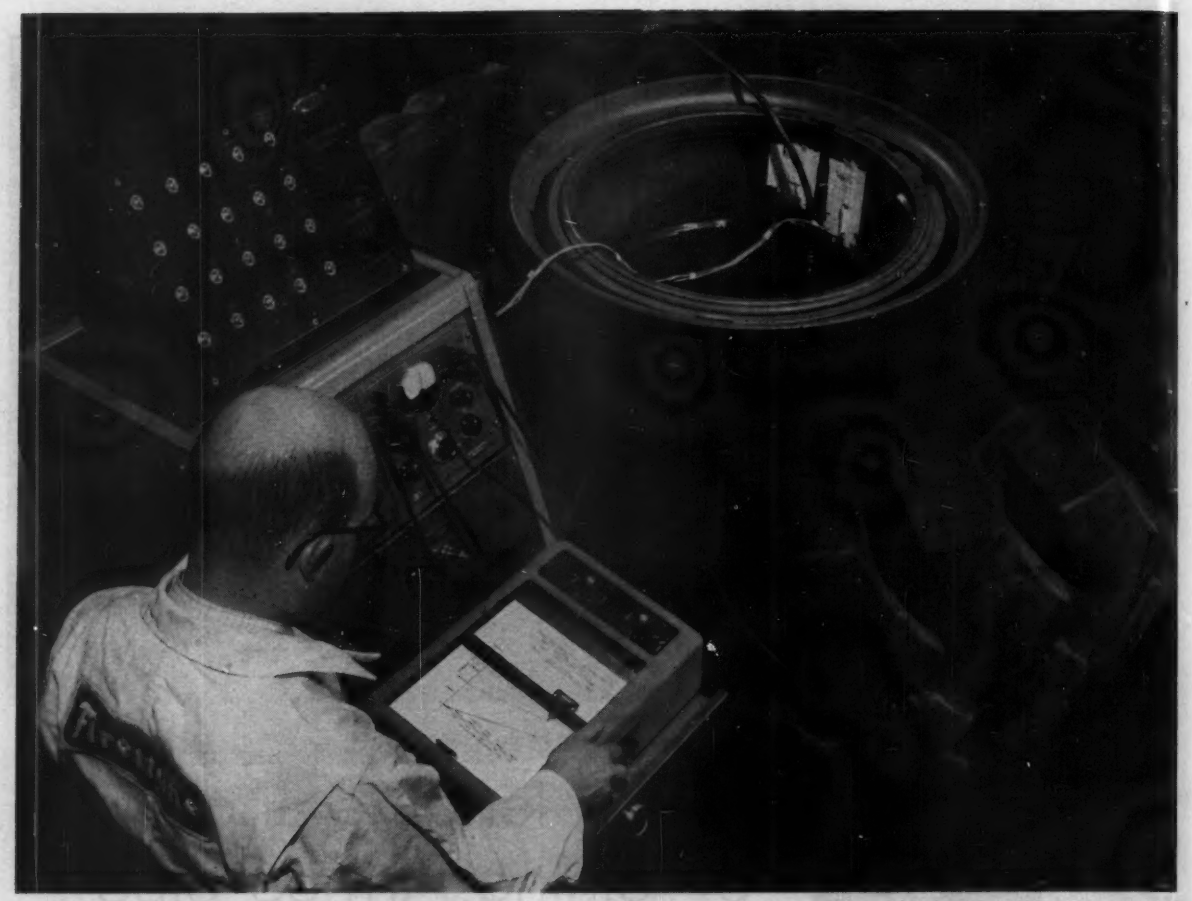
Name_____

Address_____

ARMCO DRAINAGE & METAL PRODUCTS

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company
The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products



ONLY FIRESTONE SEARCHES OUT ALL STRESS AND STRAIN TO BUILD THE WORLD'S STRONGEST RIM!

Firestone **Perma-Tite** *Rims*

Here's how Firestone's complete test program brings you built-in reinforcement at high-strain points to beat earthmover rim breakage! First, exhaustive Firestone laboratory tests chart the high-stress points caused by inflation pressure and loads. Analyses of these tests then allow Firestone Steel Products Company engineers to reinforce rim where extra strength is needed—insures Perma-Tite capacities far beyond the breakage limits of ordinary rims! Finally, thousands of hours of endurance and field tests double-check the laboratory results, prove Perma-Tite rims are the truest-rolling, strongest ever made! Perma-Tite's exclusive air seal and fusion-welding help add maximum strength and dependability to the rim. Specify Firestone Perma-Tite rims as original equipment, buy them as replacements. They're available for tubeless and tube-type off-the-highway tires.

SPECIAL PROTECTION against rust and corrosion for longer rim life, better tire performance.

INTERCHANGEABLE in complete units or by components with all earthmover rims and parts.

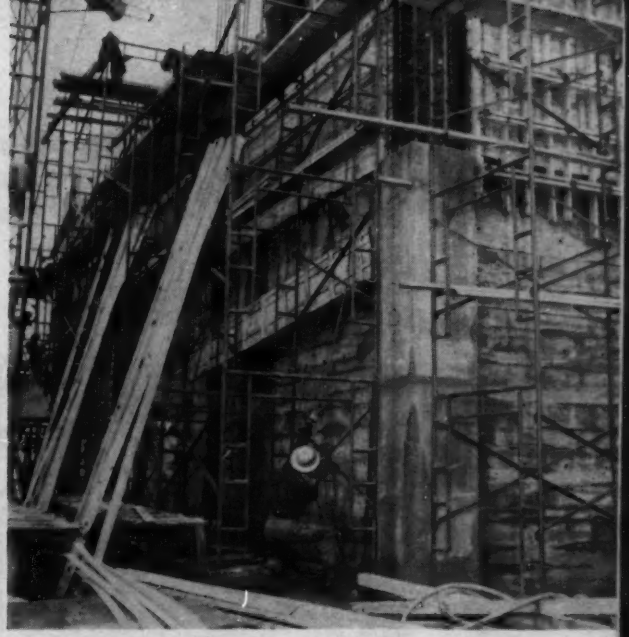
COMPLETE AIR SEAL insures retention of air at recommended pressures, delivers longer tire service.

Specify Firestone Perma-Tite Rims for Peak Performance

FIRESTONE STEEL PRODUCTS CO. *Akron 1, Ohio*

INTEGRITY, ACCURACY, QUALITY, DEPENDABILITY

POSITIONING THE PANELS—Sliding studs into place instead of nailing them to forms on the ground eliminates need for a crane.



LIGHTWEIGHT FORMS—Each panel is light enough to be handled by two men. Slings help raise forms to desired elevation.

Rough Lumber Forms Cut Concrete Finishing

ROUGH-CUT LUMBER forms give concrete a textured finish that resembles wood, hides minor blemishes, and eliminates costly hand-rubbing and finishing.

Such lumber is being used in the formwork on a concrete radar tower for the Air Force. Burns and Roe, Inc., New York, consulting engineers, designed the installation for the Surface Armament Div. of Sperry Gyroscope Co. It is being constructed in Thomasville, Ala.

The structure consists of five floors—each a monolithic pour of concrete. Reinforcing steel ties the floors together. Columns are spaced at 20 ft, and minimum wall thickness is 10 in.

Concrete forms consist of sections that are 2 ft high and 17 ft long. They are light and can be handled easily by two men.

In addition to being rough-cut, the lumber is of random width and thickness. This variation forms deliberate steps in the finished wall and covers up any unevenness in the concrete.

The lumber is No. 2 grade or better. The boards are 6 to 12 in. wide with a thickness varying between ¾ and 1½ in. The panel design and spacing allows a minimum wall thickness of 10 in.

Panel joints are horizontal with plywood strips nailed along the joints to prevent seepage of the concrete during curing. Battens hold the lumber forms together.

The forming procedure is somewhat unusual, too. The panels are coated with form oil, hoisted into position and secured in place with form ties and wales. Wales are left loose until studs have been inserted between them and the composite wall panel. Then the form ties are tightened.

Normally, panels would be nailed to studs and erected as a unit. But sliding studs into place after positioning the form sections reduces the size and weight of the panels to be handled.

Two men with simple slings can raise the lightweight form sections to the desired elevation. This greatly simplifies the formwork and eliminates the need for a crane.

Forms are removed after seven days. Cone holes are not rubbed smooth, but are scored slightly to blend with the surrounding rough-textured finish of the wall.

The floor and walls of each story are poured continuously.

TEXTURED FINISH—Concrete picks up grain of wood, hides minor blemishes.

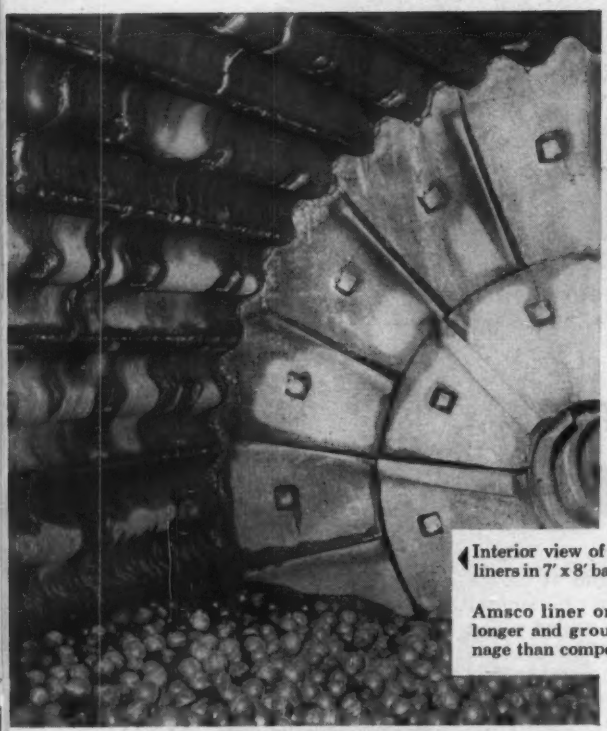
Thin wire mesh reinforces the slabs in the waffle-type floors. In addition to providing rigidity, this floor design permits the removal of the thin slab areas between waffle ribs for ducts and other installations without affecting the structural integrity.

Cardboard egg-crate type cores are used in pouring the waffle floors. The cardboard cores are light, easy to handle, and can be cut or altered to fit various shape requirements.

Two types of concrete mixes are used on the structure. The mix for foundation piles is designed for a strength of 4,000 psi while a 3,000-psi mix is poured into the walls and floors.

The finished concrete picks up the swirls and grain structure of the wood and contributes a suitable over-all texture to the building.

How AMSCO helps you HANDLE M



Interior view of Amsco double wave liners in 7′ x 8′ ball mill, using 2″ balls.

Amsco liner on left lasted 123% longer and ground 134% more tonnage than competitive liner on right.

Bucyrus 88 D four-yard bucket, equipped with Amsco Simplex 2-part Teeth, removing rock for power station. All of Tuscarora Constructors' shovels used for rock excavation are equipped with Amsco Simplex Teeth.

MORE TONS PER DOLLAR

Read how AMSCO Mill Liners and Dipper Teeth are outlasting competitive parts in severe service

AT A LARGE NEW YORK ZINC MINE...

THEY'VE DOUBLED SERVICE LIFE WITH AMSCO CHROME-MOLY BALL MILL LINERS

Amsco double wave chrome-moly liners are used on an Allis-Chalmers 7′ x 8′ ball mill at this large northern New York zinc mine. The mill is operating *24 hours a day, six days a week*... grinding rod mill discharge consisting of sphalerite, pyrite and the balance silicate and limestone gangue.

These Amsco liners ground 670,000 tons during their 29-month life... as against an average of 286,000 tons and 13-month life for the type of liners previously used. That adds up to over *100% increase in service life*. In addition to their longer life, another fact that impresses the operators about Amsco liners is that there's no circumferential grooving until the very end of their service life.

TUSCARORA CONSTRUCTORS HAVE FOUND...

AMSCO 2-PART DIPPER TEETH ARE "BEST-WEARING TEETH WE'VE EVER USED"

At the Niagara Power Project, Tuscarora Constructors are building the power station and pumping station. They're digging almost entirely in rock, working their dippers 24 hours a day, six days a week.

Dell Lundmark, Equipment Superintendent for Tuscarora, was responsible for selecting Amsco 2-part reversible teeth for his dippers. He'd heard of their fine performance elsewhere, and now describes them as the "best wearing teeth we've ever used". He says the design of the teeth is very good for rock, and adds, "We're getting *15% to 20% longer wear* than from competitive 2-part teeth".

Approximately 10,000 tons of rock are handled before the teeth are turned over ... and tips are easy to replace when completely worn.

This combination of a new alloy steel, plus the design features engineered into the Amsco Simplex Teeth, are causing equipment superintendents everywhere to change to Amsco for better, lower cost digging.

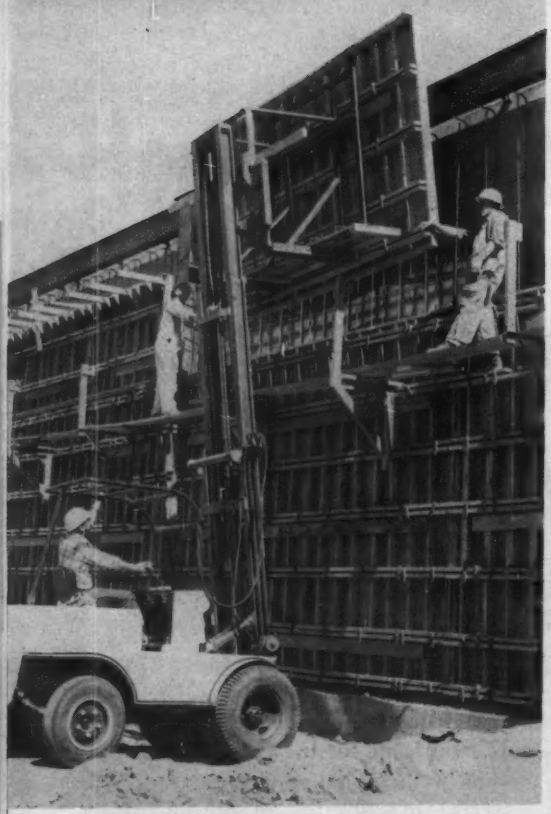
AMERICAN Brake Shoe COMPANY

AMSCO

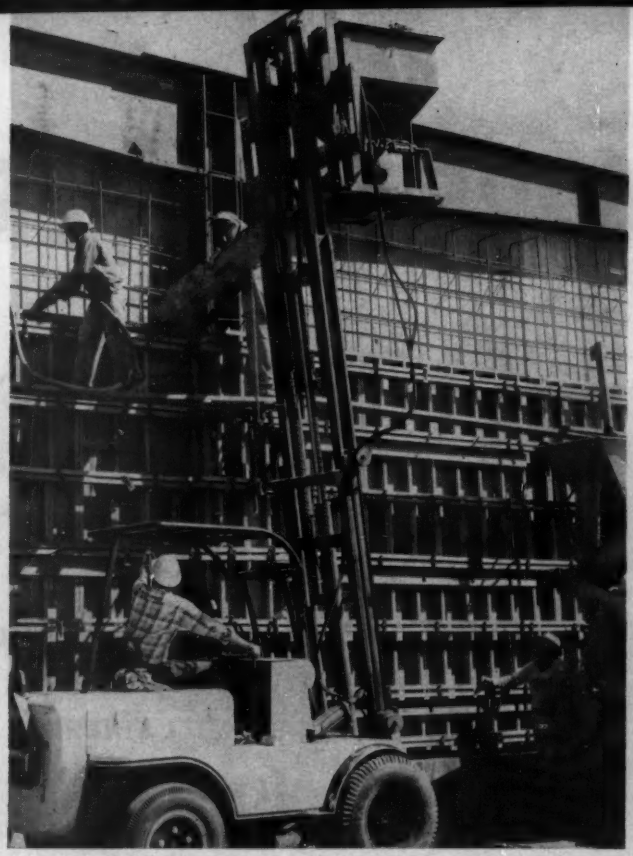
American Manganese Steel Division • Chicago Heights, Ill.

Other Plants In: Denver • Los Angeles • New Castle, Dela. • Oakland, California • St. Louis

In Canada: Joliette Steel and Manitoba Steel Foundry Divisions

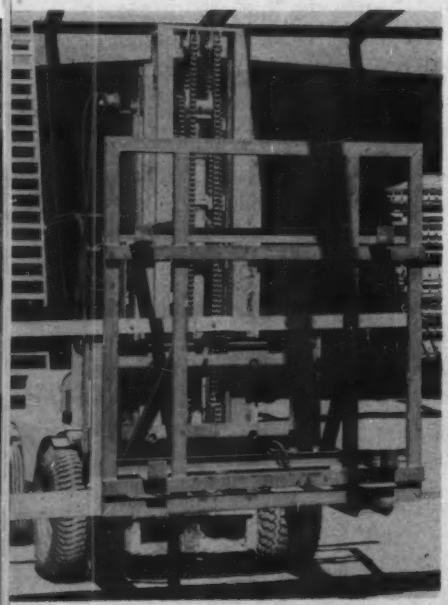


ERECTS FORMS—Fork lift raises 8x12-ft panel to workmen waiting to place it in upper lift of the wall.



POURS CONCRETE—Fitted with hydraulically tripped ¾-yd bucket that chutes concrete into wall forms, fork lift brings up wall in two lifts.

Fork Lift Forms, Pours Wall



FRAME REPLACES ARMS—Two pairs of hooks on steel frame attached to mast hold form panels, secure frame of concrete bucket. Retractable mast of rig can reach top of 20-ft-high wall.

A MODIFIED fork lift truck places form panels, pours concrete, and strips forms for a 20-ft-high concrete wall enclosing a food processing plant in Salinas, Calif.

Contractor Haas & Haynie, San Francisco, chose the all-purpose rig to bring the cost of the cast-in-place wall down to the level of precast, tilt-up construction. The midget makes it possible to build the wall without a crane and with a smaller labor force.

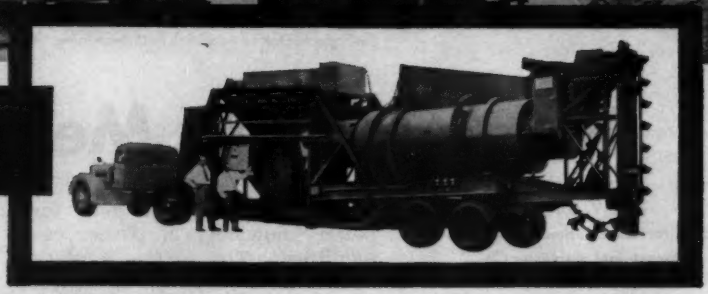
Equipped with a steel frame instead of the standard fork lift arms, the rig hooks onto the form panels and erects them in two lifts. The panels in the lower lift are 12x12 ft, built in two sections—one 4x12 ft and the other 8x12 ft. Panels in the upper lift are 8x12 ft. Form panels are plywood faced, backed with 2x4 studs and double 2x4 walers.

To handle concreting, the fork lift is fitted with a ¾-yd bucket specially fabricated for Haas & Haynie by the York Co., manufacturers of the fork lift truck. The York rig was selected because of its high front-end stability, even with heavy loads at the full mast height.

The crew brings up concrete in the wall in two pours, one 12 ft high and the other 8. The lift operator trips the concrete bucket by means of a hydraulic control. Besides the lift operator and the driver of the transit-mix truck that delivers concrete to the site, the concrete crew consists of only one man in addition to the vibrator operators.

After pouring the bottom 12 ft, they strip the 8x12-ft section of the lower form panel, leaving the 4x12-ft section in place to hold the upper 8x12-ft panel for the final lift.

Stripping goes smoothly, too. First a workman clips the tie wires holding the forms against the concrete. Once the first panel in a series is stripped by hand, the lift truck operator can strip all the others. Occasionally he needs help when forms bind, and there are some panels of unusual shape that the fork lift can't handle alone, but for the most part the rig does the stripping without assistance.



STANDARD Trailer Mounted ASPHALT PLANTS

For MORE PROFITS on low tonnage hot-mix jobs, see the STANDARD Model T-M Trailer Mounted Asphalt Plant, the biggest batch-type plant on wheels, completely self-contained in its own trailer frame . . . in 2,000, 1,500, and 1,000 pound batch capacities.

Entire plant wheels to the job, can be set up and placed in operation in as little as eight hours. Operators in the field report the Standard Model T-M Trailer Mounted Asphalt Plant produces as much as 60 to 80 tons per hour of hot mix.

STANDARD Model T-M Trailer Mounted Asphalt Plants offer the same rugged design features as the larger STANDARD Model R-M Semi-portable Asphalt Plants, including: Super-Lift Dryer with Saw-Tooth Lifters . . . Heavy Duty Hi-Speed Mixer . . . Simplex Pushbutton Batching Control . . . Positive Control of Liquid Asphalt . . . Complete Accessibility. Field proven for a number of years, the Model T-M is designed for extreme portability and top capacity. Here's the largest, most economical Trailer Mounted Batch Type Asphalt Plant in the world.

PUSH BUTTON ERECTION

Exclusive Standard power-hoist automatically raises the mixing unit from transport to operating position in less than one hour.

STANDARD STEEL CORPORATION

General Office & Plant: 5089 Boyle Avenue, Los Angeles 58, California
Eastern Division—Office & Plant: Lowell 89, Mass.
Midwest Division—Office & Plant: Decatur 89, Ill.

STANDARD ASPHALT PLANTS . . . built to do a better job!

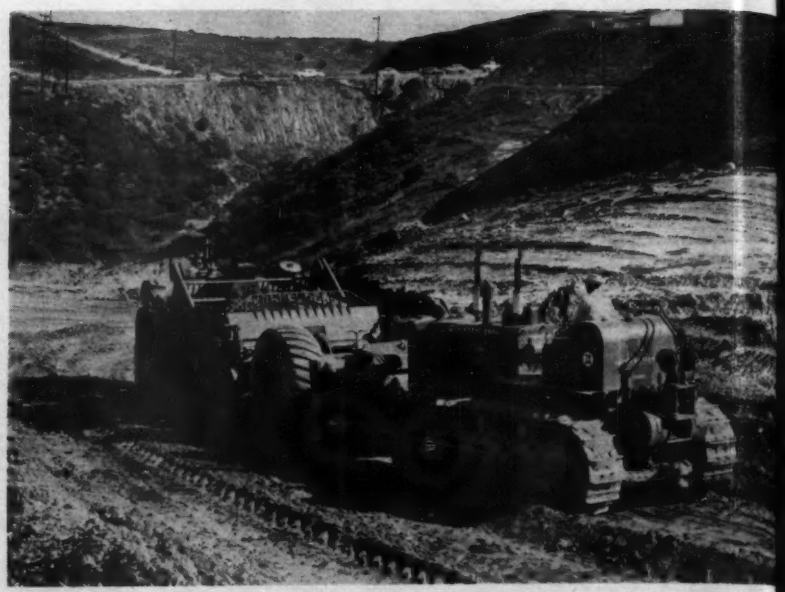
PARTS WAREHOUSES IN LOS ANGELES AND DECATUR, ILLINOIS

The rugged, massive Standard R-M Asphalt Plant packs more power, with extra capacity, over-sized vibrating screens, elevators, and dryers; larger bearings, heavier shafts and giant sized hi-speed pugmill. This gives you the toughest and most economical asphalt plant in the world. Available in 2,000 to 8,000 pound batch capacities.

STANDARD Road-Master ASPHALT PLANT

ROTARY DRYERS • KILNS • COOLERS • ASPHALT PLANTS

Matching the right pusher power to your scrapers can mean the difference between profit and loss. And you must have the answer before the machines start to work. Here's a simple way to figure out the best combination in advance.



MATCHED POWER—Down grade like this requires less power from the pusher. Grade is just one factor to consider in determining the right pusher for scrapers.

Here's How to Measure Pusher

By R. V. DAVIS
Construction Equipment Division
International Harvester Co.

THE EVOLUTION of the pusher tractor in earthmoving since World War II has been phenomenal. Working with rubber-tired scrapers, the pusher tractor has developed from a "helper" machine to a full fledged member of the earthmoving team in scraper operations.

Contractors were slow to recognize the pusher as a profit producer. They regarded it as a necessary evil during the first days of self-propelled scrapers and generally made it over from the oldest tractors they had on the job.

The pusher ranked in importance with the tractors used on cleanup work. No one worried much about proper balancing of size and power for efficient loading. The few pusher attachments available did not lend themselves to efficient operations.

The picture is different today. Contractors recognize the importance of the pusher, although they disagree about what type, size, and number to use. Pusher tractors are the best in the fleet, and their purchase price may even be greater than that of the scrapers they work with.

But there is still a need for better knowledge of pusher capabilities. The extra yardage loaded into scrapers by smart use of pushers can mean the difference between profit and loss on a job.

Loading Speed

In addition to extra payload, the speed of loading is important. The faster you load a scraper, the more trips it can make per shift. Also, the faster a pusher can load a scraper, the more scrapers it can handle.

By reducing loading time, you reduce the number of pushers required to service the scraper fleet. This in turn reduces the hourly pusher cost per scraper.

Of course, the length of haul, rolling resistance, grade resistance, and other delay factors affect the number of scrapers a pusher can handle. But the actual loading time in the cut is one of the most important single factors.

Today's scraper jobs are much better planned than they used to be. It's no longer good enough to take an average figure like 45 sec for loading or 1½ min for total pusher cycle time and apply it to all jobs. Scraper loading is as important as shovel loading on a haulage job; each represents the focal point of production.

Much has been said about balance between pusher power and scraper capacity. But differences in material weight and loading conditions make it hard to check the results until *after* the equipment is in operation. The information in this article is designed to help contractors estimate pusher performance *before* they start to work.

Two accepted earthmoving concepts are the keys to this sort of planning. One is the coefficient of traction for crawler and rubber-tired machines on different ground surfaces. The other is the generally reliable rule of thumb that a pound of pull power will load a pound of material in one minute on a level grade.

Loading Power

The first concept determines the total power available for loading. The total power is the sum of the loading power of the pusher tractor plus that of the scraper.

Loading power is not engine horsepower or advertised pull power, but rather the maximum force that can be exerted before the driving tires or tracks begin to slip. This is determined by the weight of the vehicle and the

TABLE I

PERCENT OF WEIGHT ON TRACKS OR TIRES THAT IS UTILIZED AS LOADING POWER BEFORE WHEELS OR TRACKS START TO SLIP

LOADING CONDITIONS	CRAWLER TRACKS	DRIVE TIRES
Good	90	60
Average	80	50
Poor	70	40

EFFECTIVE POWER—Table gives percentage of machine weight that is used.

TABLE II **POUNDS PULL REQUIRED FOR SCRAPER LOADING WITHIN VARIOUS TIME LIMITS**

PAYLOAD IN POUNDS	LOADING TIME IN SECONDS												
	30	35	40	45	50	55	60	65	70	75	80	85	90
10,000	20,000	17,140	15,000	13,330	12,000	10,910	10,000	9,230	8,570	8,000	7,500	7,060	6,670
9,000	18,000	15,430	13,500	12,000	10,800	9,820	9,000	8,310	7,710	7,200	6,750	6,350	6,000
8,000	16,000	13,710	12,000	10,670	9,600	8,730	8,000	7,380	6,860	6,400	6,000	5,650	5,340
7,000	14,000	12,000	10,500	9,330	8,400	7,640	7,000	6,460	6,000	5,600	5,250	4,940	4,670
6,000	12,000	10,290	9,000	8,000	7,200	6,560	6,000	5,540	5,140	4,800	4,500	4,240	4,000
5,000	10,000	8,570	7,500	6,670	6,000	5,450	5,000	4,610	4,290	4,000	3,750	3,530	3,330
4,800	8,000	6,860	6,000	5,330	4,800	4,360	4,000	3,690	3,430	3,200	3,000	2,820	2,670
3,000	6,000	5,140	4,500	4,000	3,600	3,270	3,000	2,770	2,570	2,400	2,250	2,120	2,000
2,000	4,000	3,430	3,000	2,670	2,400	2,180	2,000	1,850	1,710	1,600	1,500	1,410	1,330
1,000	2,000	1,710	1,500	1,340	1,200	1,090	1,000	920	860	800	750	706	670
500	1,000	860	750	670	600	550	500	460	430	400	380	350	330

LOADING TIME—This table gives the relationship between scraper payloads, loading power, and loading time. If you know two of these facts, table gives you the third.

Potential

type of ground surface.

Table I gives the actual percentage of the weight on the tracks or tires that is utilized as loading power for various loading conditions before the wheels or tracks start to slip.

As an example of how to use Table I, assume that a crawler pusher tractor weighs 55,145 lb. The table shows that under average loading conditions this pusher will develop 80% of the machine's weight as loading effort, or 44,116 lb.

The calculation for the scraper is more complicated. To use the table you need the weight on the drive wheels. If the empty weight on the drive wheels is 50,275 lb and the loaded weight is 67,750 lb, the average weight on the wheels during the loading cycle will be the average of these two figures, or 59,017 lb. The table shows that 50% of this weight, or 29,508 lb is effective.

Adding the two figures, you find that both machines operating under full load on level ground can develop a total of 73,624 lb of loading power.

If the machines are operating on a grade you have to adjust the figure. The adjustment is simply the total weight of the two units multiplied by the percent grade. In calculating the weight of the scraper, take the average of the empty and loaded weight.

In the above example, if the total weight is 164,800 lb and the machines are on a 5% down grade, then .05 times 164,800, or 8,240 lb must be added to the loading power. If the machines are on an up grade, 8,240 lb has to be subtracted.

Loading Time

Table II gives loading times for various combinations of payload and loading power. If 1 lb of pull will load 1 lb of dirt in 60 sec, then 10,000 lb of loading power will load 10,000 lb of dirt in 60 sec. Table II is derived by simple interpolation of these figures to include fractions of a minute.

To find the loading power required to load a 50,000 lb payload in 45 sec, subtract a zero and look in the 5,000 lb row under the 45 sec column. The figure is 6,670 lb. Adding a zero, the actual loading power comes out to 66,700 lb.

In the previous example, 73,725 lb of loading power was available for loading a 51,725 lb payload. How long should the loading take? Interpolation on Table III gives a time of 42 sec.

This example involved 24-yd scrapers on an actual job. Measured loading time was 39 sec compared to the calculated time of 42 sec. Other time and weight studies with various scraper-pusher combinations have shown that the calculated values usually are within 10 sec of the actual times.

Generally loading time should be less than 45 sec. But with long hauls, loading time becomes relatively less important than extra yardage in the scraper.

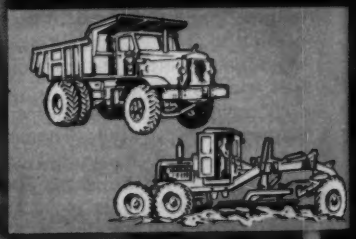
After you have determined the loading time, add transfer time (the time lapse between contact with one scraper and the next) to get total pusher cycle time. Transfer time usually runs about 24 sec. It does not include waiting time when there is no scraper available.

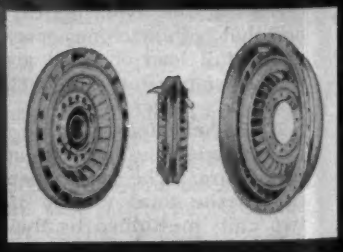
If loading time seems too long, calculate the effect of adding a tandem pusher. Experience indicates that tandem-pushed payloads are 10-15% higher than single-pushed loads. The additional loading power also reduces loading time.

A tandem pusher setup has one advantage in that it often is handy to have the extra tractor on the job. If it is not required for pushing all the time, it can be useful for ripping, dozing, and other chores.

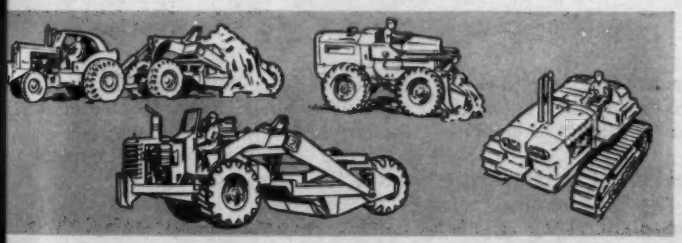
Whether the job calls for tandem or single pushers, proper selection is the key to greater profits. By calculating the correct scraper and pusher cycle time, the estimator can achieve near perfect teaming of scrapers and pushers before the work begins and machines are chosen.

What's it costing





you to keep the "stick"



EVEN IF YOU HAVE only top operators on all your equipment, the cost of keeping a stick-shift comes to a pretty penny: too-frequent, high repair bills for unavoidably shock-loaded drive lines and axles—engines being overhauled twice as often as necessary at $1,200 to $1,500 per overhaul—and, of course, those incessant clutch repairs and replacements.

No Operator Matches TORQMATIC Efficiency—

—for no operator can handle the stick as smoothly and efficiently—*every* time—as an Allison TORQMATIC DRIVE.

TORQMATIC adjusts your engine output and speed—automatically—to meet every change in load or terrain. It never fatigues—no matter how long or how tough the job. It needs no costly training—in fact, TORQMATIC owners report they're saving between $1,500 and $2,000 every time they train a driver because rookies can't make a shifting or clutching mistake.

It's Working for You or Against You

So it's easy to see that a TORQMATIC DRIVE is a real money saver. One thing is sure: you're either cashing in on its advantages on every job you bid for—or competing against men who do, who bought TORQMATIC because they looked at *total* cost, not just *first* cost.

And remember—TORQMATIC is available in almost every type—and well over 100 makes—of equipment. It's been proved—on years of tough jobs—far beyond any other hydraulic transmission. Just see your dealer—or write Allison for details.

ALLISON DIVISION OF GENERAL MOTORS
Indianapolis 6, Indiana

In Canada: General Motors Diesel Ltd., London, Ontario

Allison TORQMATIC

TORQMATIC® DRIVES

THE MODERN DRIVE FOR MODERN EQUIPMENT

Built stronger to last longer—Allison casts its converter for extra strength, greater precision—and the converter is *integrated* with the transmission for a neat, easily serviced installation.

Runway Paving Operation Hits Peak of 5,300 Yd a Day

It takes high-output equipment to produce and place the 480,000 cu yd of concrete for the three long runways at the Washington International Airport.

AGGREGATE A brand-new plant located just three miles from the job site supplies more than 10,000 tons of crushed stone per day for concrete aggregate and base course material. Capacity of plant is 900 tons per hour.

MOVING A MOUNTAIN of material—sand, stone, and cement—is the daily routine at Washington International Airport, Chantilly, Va. Contractor C. J. Langenfelder & Son, Inc., Baltimore, have placed about 110,000 cu yd of runway concrete in just a little over two months. They're averaging more than 4,000 yd per day now.

To hit this heady pace they've set up a concrete plant that rivals anything you're likely to find. It features three 10-yd tilting mixers. Capacity of the plant is about 450 cu yd per hour.

A fleet of trucks delivers material in a steady stream to keep the jumbo-size plant producing at this rate. Some 35 trucks deliver 5,000 tons of stone aggregate per day from a nearby commercial crushing plant. About four dozen 100-bbl cement trucks are in constant service on the road between the site and the plants of cement suppliers.

The three 10-yd T. L. Smith mixers are the pulsing heart of the concrete plant. They gyrate endlessly on top of their steel towers, pausing only every three minutes, at the end of a mixing cycle, to tilt downward and spew their contents into one of the thre 20-yd hoppers that feed Dumpcrete trucks waiting below.

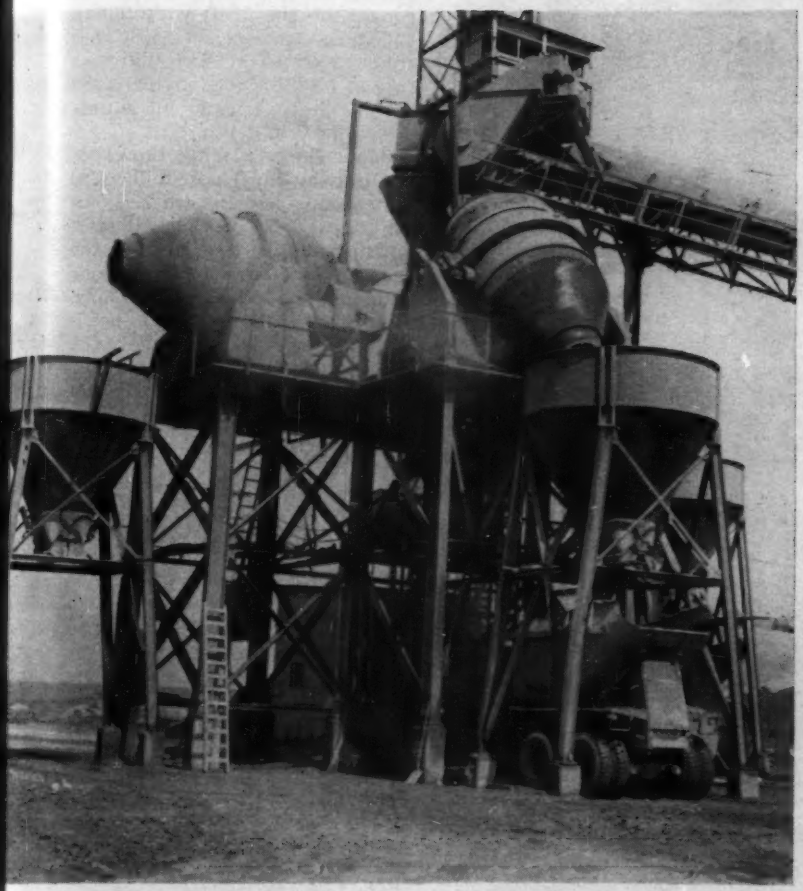
Satisfying the appetite of these monster mixers is an endless job. But the plant is set up to keep material flowing steadily from stockpile to batcher to mixer.

Three stockpiles supply sand and two sizes of stone. Trucks ordinarily dump material directly into 14x22½-ft bins at each stockpile. The bins feed 30-in. conveyors carrying material to the batch bins. But a front-end loader is available on each pile to shove material into the bins when they get low.

Three 100-ton hoppers at the batcher hold sand and stone. A 600-bbl cement bin, fed by two 7,500-bbl storage silos, supplies the cement. The Noble batching apparatus is semi-automatic. A 60-in conveyor delivers the dry batch to one of the three tilting mixers.

Water comes from two 8-in. wells drilled 800 ft deep. Submersible pumps at the bottom of each well push the water the quarter-mile to the plant. There the water flows into a 20,000-gal storage tank that feeds a smaller tank at the top of a tower next to the concrete mixers.

A fleet of 25 White trucks with

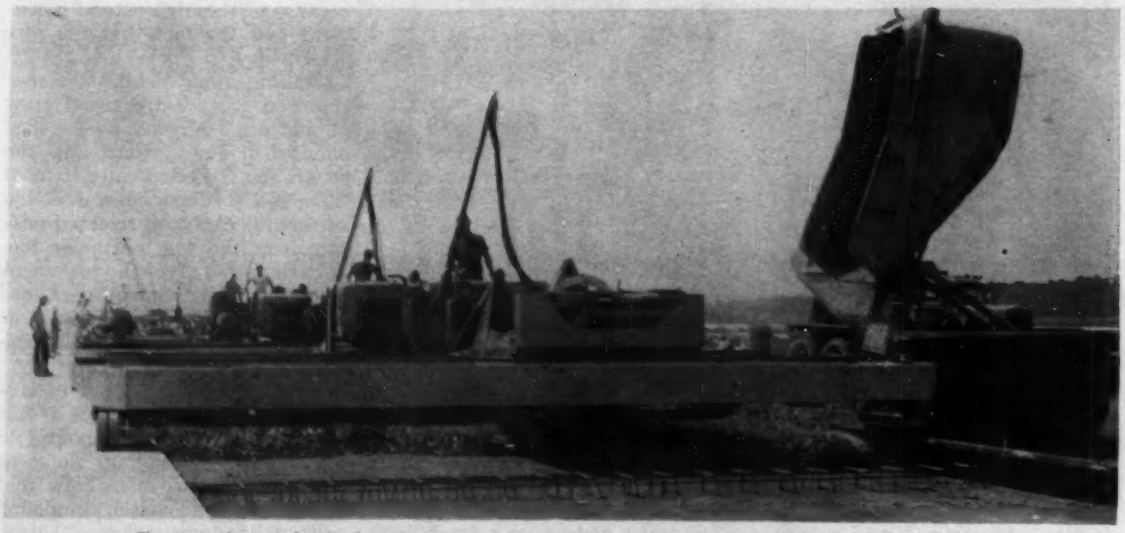


CONCRETE Three 10-yd tilting mixers are the heart of giant concrete plant that produces 450 yd per hours to keep job rolling at steady clip.

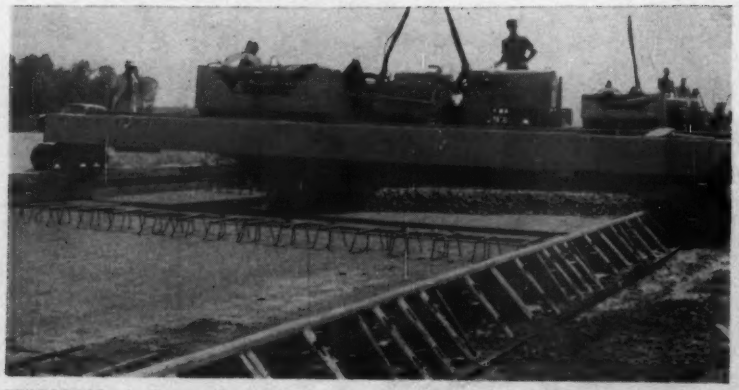
Dumpcrete bodies hauls the mix from the plant to the paving spread. They hustle back and forth like a swarm of busy ants. Average haul distance is about 3 mi from the centrally located plant. Cycle time for this distance is about 15 min. But hauls vary considerably, depending on the location of the paving spread.

Haul roads are kept in good condition. They run along both sides of the runway. The trouble spot is at the turnarounds. There the big trucks have to swing off the edge of the narrow haul roads to maneuver into unloading position. Despite a relatively dry summer, the trucks stir up a messy mire in the sticky red clay that abounds on the job.

continued on next page

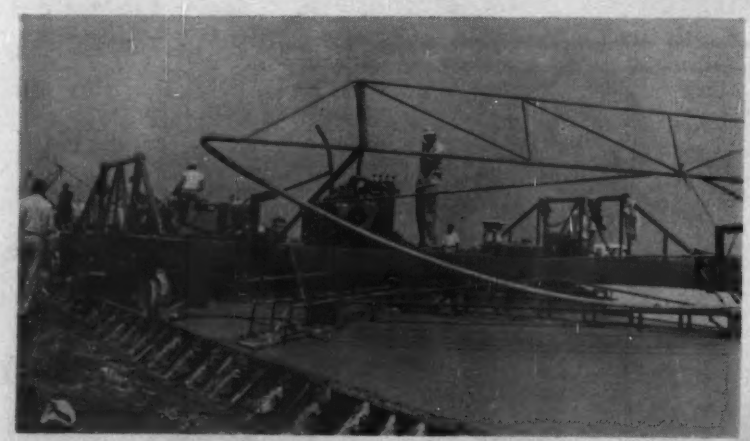


PAVING Two spreaders at head of paving train place concrete along 11,500-ft runway. A fleet of 25 Dumpcrete trucks hauls 6-yd batches from the concrete plant to the spreaders, an average distance of three miles.



SPREADERS—Its hopper loaded by Dumpcrete trucks that back into position at the side of the runway, this Maxon spreader distributes concrete evenly over 25-ft-wide lane.

FINISHERS—Two Jaeger machines strike off the 15-in.-thick concrete with their double transverse screeds. High placement rate and dryness of mix make concrete hard to work.



FLOAT—A V-shaped bull float on this Lewis finisher-float touches up behind two transverse screeds at front of machine. Paving train averages about 4,000 cu yd daily.

RUNWAY PAVING... *continued*

Langenfelder is now starting to pave Runway No. 1. They completed Runway No. 2 and its adjoining taxiway last month. They'll probably leave the six concrete crossovers connecting runway and taxiway until next year, but they may bring in a 34E paver and set up a dry-batch operation to get work on the crossovers under way this fall.

Both Runway No. 1 and No. 2 are 11,500 ft long. The runways consist of six 25-ft-wide lanes. Thickness of pavement varies from 12 to 15 in. The taxiways consist of three 25-ft-wide lanes of concrete pavement, all a uniform 15 in. in depth.

Sequence in placing the lanes on Runway No. 1 will follow the pattern successfully worked out on Runway No. 2. They'll start with one of the two lanes at the center of the runway, then work back on the other center lane. Then they'll pave the adjacent lanes on each side, and finally the two outside lanes.

The paving spread consists of an array of machines carefully selected to work effectively together. At the head of the train, two Maxon spreaders distribute the concrete across the width of the lane. They bring the concrete up in two lifts. There is no mesh reinforcing between the two lifts.

Two Jaeger double-screed transverse finishers follow the spreaders to strike off the freshly placed concrete. The rear spreader and the front finisher are equipped with vibrators that consolidate the concrete before any screeds pass over it.

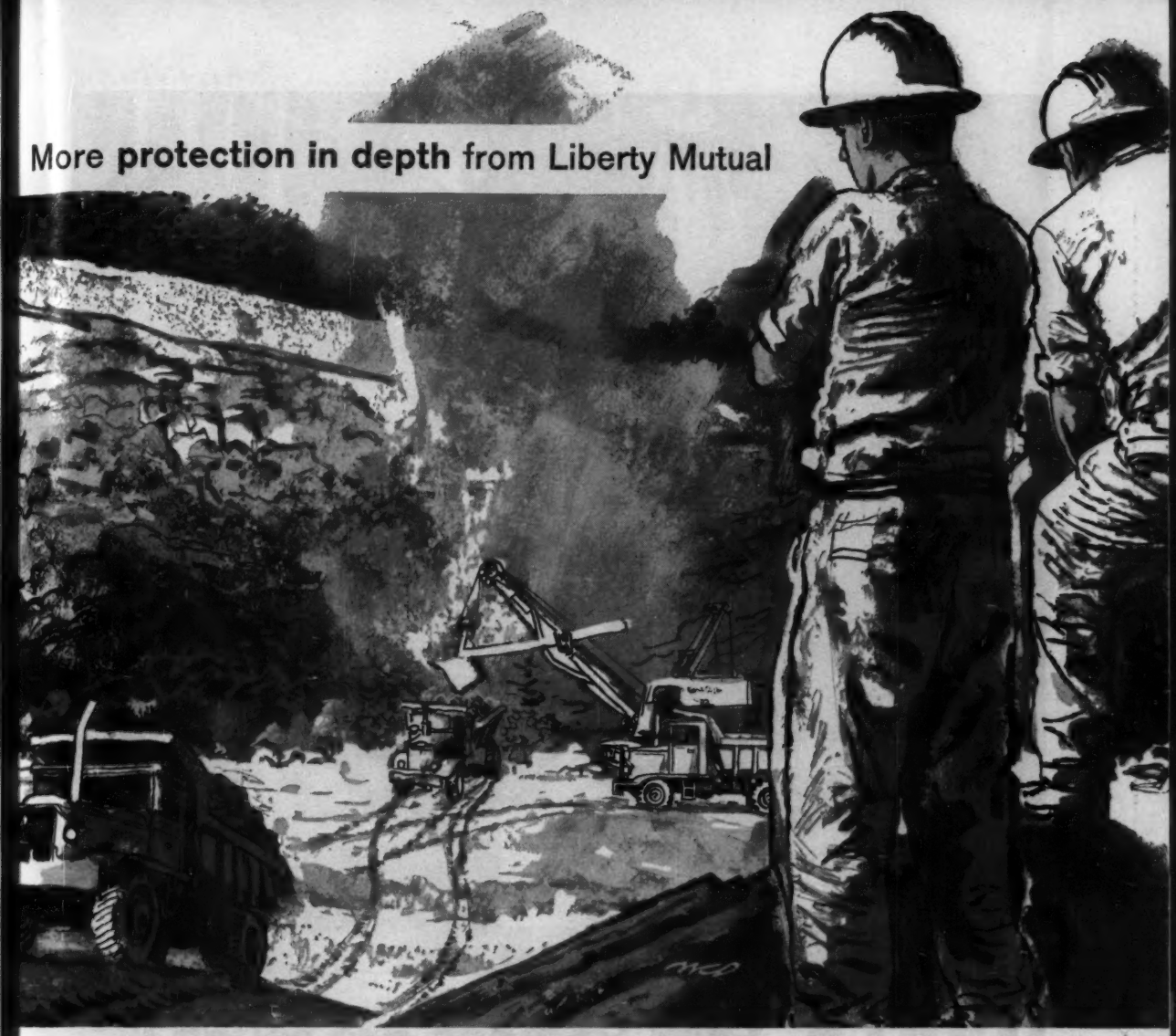
Next in line in the train is a Lewis finisher-float with double transverse screeds and a V-shaped bull float. That makes six transverse screeds along the line to work the concrete into shape. Seems like a lot, but the contractor finds all of them are needed because of the high rate of placement and the fact that the mix is very dry.

Trailing along behind the mechanized units is the usual crew of finishers. Four men wield long-handled floats to touch up the rough spots. Periodically, two of them roll a rubber hose over the surface to carry off excess moisture from the wet mortar on top. A burlap drag gives the pavement a rough texture. Smoothness specifications allow a tolerance of only ⅛ in. in 10 ft, so the finishing crew has to work carefully.

Far behind the spreaders is a Rex machine that applies a coat of Permite curing compound to the concrete. Tagging along at the rear is a two-man crew that applies a second coat of compound with a hand spray.

continued on page 125

More **protection in depth** from Liberty Mutual



Eliminating confusion and congestion is vitally important during rock cutting and removal. Liberty Mutual safety engineers will study your site, help you spot hazards and set up a safe traffic pattern. This service is all a part of protection in depth.

How to keep order down on the floor and cut your compensation costs

A deep cut has long meant danger. When your shovels, dozers and dump trucks must operate in close quarters, extra hazards are created. Injuries, work stoppage and higher insurance costs are often the result.

Today, Liberty Mutual's wealth of knowledge and experience in road-building safety is called on by contractors coast to coast. Construction safety engineers are ready to show you dozens of ways to reduce on-the-job hazards.

This extra service in safeguarding your road gangs is a function of Liberty's protection in depth. From the start of your Liberty coverage, protection in depth helps you avoid accidents and losses, lessens their impact if they happen. This means lower insurance rates, giving you a competitive edge on your job bids.

Protection in depth has helped thousands of Liberty policyholders cut insurance costs through experience modification. To learn how it can help *you*, write or phone your nearest Liberty Mutual office. There are 146 of them located all across the country.

Look for more from

LIBERTY MUTUAL

...the company that stands by you

LIBERTY MUTUAL INSURANCE COMPANY • LIBERTY MUTUAL FIRE INSURANCE COMPANY • HOME OFFICE: BOSTON
Business Insurance: Workmen's Compensation, Liability, Group Accident and Health, Fire, Fleet and Crime
Personal Insurance: Automobile, Fire, Inland Marine, Burglary, Homeowners'

WHY? Ford Engines are tough! Ford Service is everywhere!

Ford Industrial Engines are becoming the solid favorite on construction jobs everywhere—primarily because of their many durability features.

You'll find, for example, that every Ford Engine has Short Stroke design that cuts engine friction, reduces wear . . . deep-block construction that minimizes vibration, lengthens bearing life . . . and overhead-valve design for greater operating efficiency and economy.

Ford Engines range from 134 to 534 cubic inches . . . including two modern Ford Diesels and three Super Heavy Duty V-8's—*all* available as power units or complete engine assemblies. To meet special fuel needs, gasoline engines can be adapted to LP- or natural gas.

As a Ford power user you need never concern yourself about costly downtime . . . for there's always a Ford Dealer nearby to give you the service you need *when you need it.*

Little wonder more and more profit-minded operators are swinging to Ford every day. For original installation or re-powering, specify Ford Industrial Power.

Ford
INDUSTRIAL ENGINES
AND POWER UNITS

INDUSTRIAL ENGINE DEPARTMENT • FORD Division of FORD MOTOR COMPANY
P. O. Box 598, Dearborn, Michigan

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED!

INSTALLING JOINT—Three-man crew places two 12½-ft-long plastic joint-forming strips into hydraulically operated holding bar of special rig that vibrates strips down into freshly placed concrete until tops are flush with surface. It takes less than a minute.

PICK—Workman picks away mortar covering to expose the ends of the strips.

PULL—Plastic spreader strip pulls loose from enclosing envelope with one yank.

POLISH—Special job-made chisel fits groove, chips out obstruction at the ends.

But there's another unit in the spread that has nothing to do with placing or finishing the concrete. It places the plastic strips that form the transverse contraction joints.

This is a new method of forming contraction joints in concrete pavement. It promises to become a lively contender in this field. The method consists of placing a high-impact vinyl plastic strip in the freshly placed concrete, vibrating it down through the aggregate with a special machine.

The plastic strip is actually two pieces: a V-shaped envelope and a spreader strip that fits inside. When the concrete is set up, workmen pull out the spreader strip, collapsing the envelope so that it, too, can be pulled out. The result is a clean, even groove in the concrete that later can be filled with asphaltic joint material to complete the joint.

Main advantage of the method is that the relatively inexpensive plastic strips can be used over and over again. On this job the contractor is getting about 8 to 10 reuses. But the manufacturer claims that under less trying circumstances, reuses may run as high as 20. The hard, abrasive trap rock used for concrete aggregate here gives the strips a more than normally severe test.

The strips come in 12½-ft lengths for airfield work. About 3-in. deep, they taper from ⅜ in. in width at the top to about ⅛ in. at the bottom. A box of 40 costs $475.

Developed by American Sisalkraft Corp. and marketed by them under the trade name Form-con, the plastic strips have so far undergone only a few job tests. S. J. Groves & Sons Co. used them last year on a highway job in New York. (The strips come in smaller sizes for highway work. Depth is 2 in. instead of 3 in. Lengths available are 11 ft and 12 ft.) Hyde Construction Co. used them for the first time on an airfield job at McCain Naval Air Station in Mississippi. They worked out well on both tests.

Langenfelder saw them in use on Hyde's airfield job and decided to try them on Washington International Airport. So far they are well pleased with the outcome. Paving superintendent R. C. Ma-

thern offers his unqualified approval: "It's the best joint forming method there is as far as I'm concerned."

American Sisalkraft is limiting their hand in the new joint forming method to manufacturing the plastic strips. But they're working with equipment manufacturers to make sure there are machines available to handle placement. On this job a Pemco rig places the strips.

The self-propelled joint installer takes its place in the train behind the finisher-float. The three-man crew places two 12½ ft strips in the holding bar, which is then hydraulically lowered to the concrete. High frequency vibration of the bar as it cuts into the concrete pushes aside aggregate and makes way for the strips. Then the operator releases the clamps holding the strips and pulls up the holding bar. The strips remain embedded in the concrete, their tops flush with the surface. Placing the strips takes less than a minute.

When a strip sticks out of the concrete more than a fraction of an inch, the men reach down and shove it deeper into the concrete with wood poles. This doesn't happen very often. The machine, on the whole, does a fast, accurate job.

But there is a little mess to clean up afterwards. After placement of the strip, two men with long-handled floats smooth the disturbed concrete on each side of the joint.

Pulling out the plastic strips when the concrete is set goes smoothly, too. A four-man crew handles the job. They ordinarily remove the strips about five days after the concrete is placed.

One man works ahead of the rest, picking away with a screwdriver at the thin layer of mortar covering the strips. He doesn't have to expose the full length of the strip, only a short section at the center of the lane where the strips meet.

With the ends of the plastic strips exposed, he begins to work the spreader strip loose from its enclosing envelope. He does this with two screwdrivers, working their points under the edges of the T-shaped head of the spreader strip.

Another workman then grips the head of the spreader strip with pliers and pulls it out enough to get a good hand hold. One good yank and the strip peels out of the envelope amid a shower of cement flakes. With the spreader strip removed, the envelope collapses, making it a simple matter to pull it loose, too.

A workman then checks the joint for feather edges or obstructions built up at the ends where the strips meet. He uses a chisel specially made to fit the groove to break them away.

While two workmen remove the plastic strips, the other half of the crew cleans the removed strips and makes them ready for their next use.

In the broiling heat reflected by the concrete pavement, the crew has a tough job. But they keep moving fast through the long 10-hr day. Their best record for a day is 340 strips removed.

continued on page 128

miller

FIVE IN ONE

FIREBALL

Other Miller welders in this series include:

DA-300-L BIG RIG
Four-in-One:
AC arc welder; DC arc welder; 10 KW AC power plant; 1 KW DC while welding

D-250-L ROUSTABOUT
Three-in-One:
DC arc welder; 10 KW AC power plant; 1 KW DC while welding

D-250-W ROUGHNECK
Two-in-One:
DC arc welder; 1 KW DC while welding

Here's what makes this Miller model the "Five-in-One":
1. AC welder for metallic arc welding
2. DC welder for metallic arc welding
3. AC or DC welder for TIG welding
4. A 10 KW, 115/230v single phase 60 cycle power plant
5. 1 KW of DC while welding

The DAH-350-L Fireball, driven by Hercules 32 hp engine, is another Miller FIRST, offers both a-c and d-c for metallic arc or TIG welding with three separate a-c and d-c amperage ranges for each.

There's continuous high frequency for a-c TIG welding with choice of "start only" or constant high frequency for d-c TIG work.

Standard equipment includes built-in high frequency stabilizer, polarity switch, power supply for water coolant system, and automatic inert gas control panel with solenoid valve and post flow timer. Trailers are available for welder only or for welder with coolant system and gas cylinders.

SPECIFICATIONS

	Metallic Arc	Tungsten Arc
WELDING RANGE	35-100 Amps AC	35- 75 Amps AC
	65-160 Amps AC	65-160 Amps AC
	110-400 Amps AC	150-375 Amps AC
	35- 80 Amps DC	35-100 Amps DC
	75-175 Amps DC	85-225 Amps DC
	125-350 Amps DC	170-375 Amps DC
RATED OUTPUT	250 Amps Tungsten Arc, 100% Duty Cycle DC	
	300 Amps Tungsten Arc, 100% Duty Cycle AC	
CURRENT ADJUSTMENT STEPS	Infinite	
MAXIMUM O.C.V.	72 Volts DC	
	80 Volts AC	
1 KW DC AUXILIARY POWER	115 Volts	
AC GENERATOR OUTPUT	10 KW	
OUTPUT VOLTAGE	115/230 Volt, 1 Phase, 60 Cycle	

Complete specifications on these welders will be sent promptly upon request.

miller ELECTRIC MANUFACTURING COMPANY, INC., APPLETON, WISCONSIN

EXPORT OFFICE: 250 West 57th St., New York 19, N.Y. • Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal

TROJAN GETS ITS SEA LEGS

...outclasses all other tractor shovels for principal job of barge unloading at concrete pipe plant...

e tried out six loaders before we bought our Trojan," says ph M. Simpson, plant superintendent, Seattle Concrete Pipe mpany in Seattle, Washington.

PLACES TWO MACHINES

er landing the job of "handy-man," the Trojan went on to prove ould easily take the place of a crane and truck in the unloading of ges and distribution of material — and do it more efficiently, more nomically. Its fast cycle operation proved invaluable as this major nge was made in the handling of incoming materials.

OTHER PAT-ON-THE-BACK FOR TROJAN

. Simpson goes on to say, "Not only does the Trojan serve us well ts primary job of barge work, it moves material all over the yard, ns up, moves other equipment and even levels ground. We tried m all and judged the Trojan best for the job."

ST BY TEST

s is one more example of Trojan's ability to outwork other chines. Ask your distributor . . . he'll be glad to demonstrate outstanding versatility on *your* job.

Here, on board the barge, the hard-working Trojan picks up another load of gravel for transportation to the stockpile area.

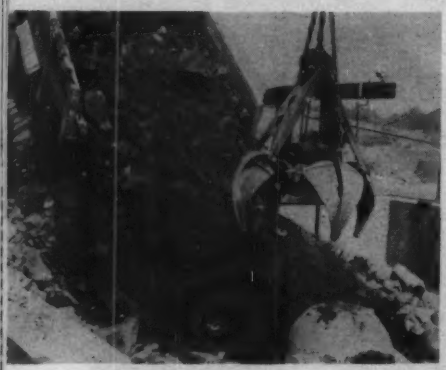
AD NO. 44-69

The Trojan line includes eight models with lifting capacities from 5,000 to 20,000 lbs. and bucket capacities from 1 to 4 cu. yds.

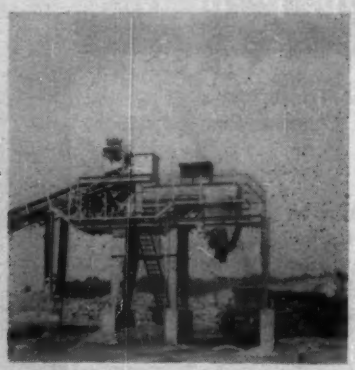
THE YALE & TOWNE MFG. CO.
TROJAN DIVISION
BATAVIA, NEW YORK • SAN LEANDRO, CALIFORNIA

TROJAN®
TRACTOR SHOVELS
YALE & TOWNE

AGGREGATE PLANT—Four sets of triple deck screens sort stone into eight bins that feed trucks hauling aggregate to concrete plant at site, three miles away. Three-stage crusher cycle breaks rock from quarry from maximum 42 in. to graded sizes less than 2 in.



START—Truck dumps rock into primary crusher. Grapple keeps material flowing.



FINISH—Trucks wait in line for blended base material from Cedarapids pug mill.

RUNWAY PAVING . . . *continued*

With every step in their paving operation geared for high production, Langenfelder has achieved a top production so far of 5,300 cu yd in a single day. That's about 4,600 ft of 25-ft-wide, 15-in.-thick pavement. The job calls for a total of 480,000 yd of concrete.

Keeping the paving train rolling at this rate means there can be no bottlenecks anywhere along the line. And that goes for preparing the base course. Langenfelder makes sure base course is placed and ready for paving at least 5,000 ft ahead of the train.

The base course material is a blend of crushed trap rock varying in size from about 2 in. down to fine screenings. It's built up in two 4½-in. lifts.

Two Caterpillar graders level the strip before placement of the base material. On both courses a D8 pushes an Ulmac spreader that distributes the material. Two 72-in. Essick vibratory rollers consolidate each lift.

Trucks haul base course material 3 mi from the same mammoth crushing plant that supplies the concrete aggregate. On a typical day they deliver 5,500 tons of the graded stone. On top of the 5,000 tons of crushed stone used each day as aggregate, that adds up to a tremendous load on the plant.

But it's big enough to meet the challenge. Chantilly Crushed Stone Co. built the plant with this job in mind. They completed it last spring, just in time. Capacity is about 900 tons per hour. Now almost its entire output is going to Langenfelder. There's not much to spare.

The quarry at the plant furnishes a good grade of diabase trap rock. They blast out about 25,000 tons twice a week. Three Ingersoll-Rand Drillmasters drill 5-in. holes at 10x10-ft spacing. Average depth is 35 ft.

Four 2½-yd Northwest shovels load the blasted rock into a fleet of ten 22-ton Euclid rear-dumps that feed the primary crusher. Fragmentation is good, but a Northwest crane with 6,500-lb headache ball is on hand to break up chunks that exceed the maxi-

The right design, the right steel, the right shape make *ESCO* Points and Adapters right for every digging condition.

The construction industry looks to

Electric Steel Foundry Co., PORTLAND, OREGON

See reverse for shapes and size range

Here are the points to remember...

12M ALLOY STEEL

ESCO 12M Points are the toughest you can buy. Developed through years of research for the construction industry, cast *ESCO* 12M is carefully heat treated to produce the finest steel made for the severe shock and abrasion encountered by points and adapters.

RIGID QUALITY CONTROL TESTS ASSURE TOUGHNESS, HARDNESS

Every *ESCO* Point is Brinell tested to assure the exact degree of shock-absorbing toughness and abrasion-resisting hardness for longer digging life. Be sure to look for the Brinell mark on every *ESCO* Point you buy.

8 POINT SHAPES

You can select from eight different shapes to find the point that matches your digging conditions. *ESCO* Points are designed by bucket and excavation specialists who know how to achieve top digging performance. The self sharpening design of an *ESCO* Point makes it start sharp and stay sharp.

ESCO Points and Adapters for all digging equipment

Your local ESCO dealer can supply Points and Adapters for all your digging needs. By using ESCO Points and Adapters on all your equipment you can cut costs further by reducing your point inventory and consolidating purchases. Call your ESCO dealer today for details. He's listed in the yellow pages of your telephone directory. Or, write direct.

LITHO IN U.

ESCO Point shapes . . . start sharp, stay sharp and last longer under any digging condition.

ESCO

Electric Steel Foundry Company

2149 N. W. 25TH AVE. • PORTLAND 10, OREGON

MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.
Offices in Most Principal Cities
ESCO INTERNATIONAL, NEW YORK, N. Y. • IN CANADA ESCO LIMI

mum 42-in. size that the crusher can handle.

The trucks dump into a concrete bin that feeds the primary crusher. A ¾-yd Northwest crane with a grapple keeps the big chunks from getting stuck and stopping the flow of material into the crusher.

The primary crusher is an Allis-Chalmers model 4265 gyratory crusher. It reduces the rock to about 6 in. A 42-in. conveyor carries the material from the crusher to two 6 x 14-ft double-deck screens (all plant screens are Tylers) that take out all sizes less than 2 in. A 30-in. conveyor carries material passing the screens to two 5x14-ft single-deck screens that separate it into sand and graded stone up to the maximum 2-in. size. Two 24-in. conveyors build up separate stockpiles of sand and stone.

Oversize material retained on the first set of double-deck screens is fed into a secondary crusher to be reduced to about 3½ in. The secondary crusher is an Allis-Chalmers model 1784 Hydracone crusher. Then a 42-in. conveyor carries the material to a set of four 6x14-ft triple-deck screens that sort the material into eight 45-ton aggregate bins. These bins feed the trucks that haul aggregate to the concrete plant.

Material larger than 2½ in. is retained on the top deck of the screens and is recirculated by a 30-in. conveyor to two Allis-Chalmers model 751 Hydracone crushers for third-stage reduction. Two 24-in. conveyors carry material passing the last set of screens to two stockpiles, one for material less than 1 in., the other for fine screenings.

A 36-in. tunnel conveyor runs underneath the four stockpiles inside a 9-ft-dia Armco corrugated pipe. Two Syntron electrically operated feeders under each stockpile load material onto the tunnel conveyor in controlled quantities. The tunnel conveyor carries the material to a Cedarapids pug mill that mixes the material into a uniform blend. About 6% moisture is added in the pug mill to stabilize the blend. Overhead hoppers, fed by the pug mill, load the trucks that haul the base course material to the site.

The plant is set up now to meet the special requirements of Langenfelder. But L. B. Smith, Inc., Camp Hill, Pa., designers of the plant, laid it out so that it will be flexible enough to meet future demands.

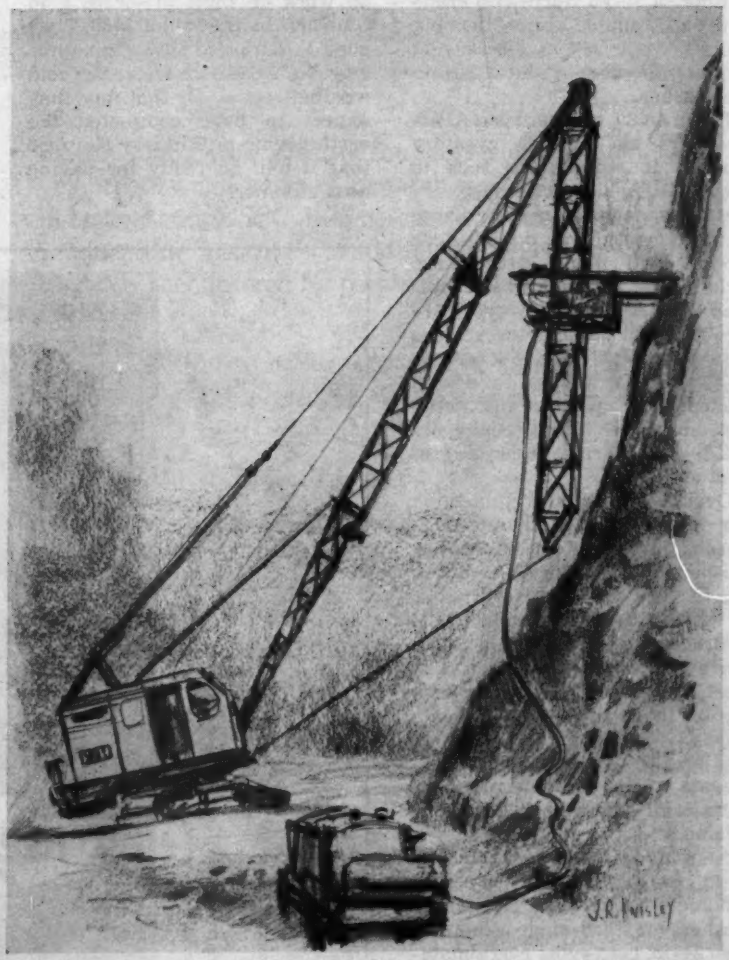
Langenfelder expects to clean up work on their $19-million in contracts by the fall of 1960. They hope to complete paving on Runway No. 2 this fall before the cold weather sets in. By that time they expect to have completed the earthmoving on Runway No. 3, so that it will be ready for paving next summer.

Project Manager Bill Hazlehurst is in charge at the site for Langenfelder. B. G. Woolfolk is general sueprintendent. Paving superintendent is R. C. Mathern. In charge of the concrete plant is Orville Carver. Project engineer is Bill Gable.

Ammann & Whitney, a New York consulting firm, is in charge of supervising construction for the Federal Aviation Agency. S. R. Ransome is resident engineer.

SIMPLICITY
in the Heart of the
Modern Diesel Engine
Simple—Only 8" long, 3¼" wide, 5½" high . . . weighs less than 10 pounds . . . fewer parts to service, fewer adjustments to make.
Versatile—Because of accessories that can be built in or added at low cost taking up no, or very little, valuable engine block space.
Economical—Initial cost is less, costs less to service, saves money because of its dependable service.
HMS
ROOSA MASTER
Write for guides to better fuel injection. One features the pump, the other an efficient, economical filter.
HARTFORD MACHINE SCREW CO., HARTFORD 2, CONN.
Division of Standard Screw Company

Elevator Rig Drills Holes



On the first dam job this contractor ever tried, he found he had to devise a rig to drill horizontal holes in the face of a cliff. With the help of a drill manufacturer, he designed a machine that can handle this difficult work efficiently.

By ANDREW ONEGLIA
President,
Oneglia and Gervasini, Inc.
Torrington, Conn.

WE BUILT this rig to drill horizontal anchor-bolt holes in the face of a rock cliff against which we'll pour a concrete spillway for Thomaston Dam at Thomaston, Conn.

It's just a pair of drills mounted on an elevator tower that is suspended from a crane boom. But it's been a handy tool on this job.

Our $4.3-million contract, with the Corps of Engineers, is our first venture into dam building. The structure will be a flood control dam across the Naugatuck River.

The rock ridge over which the dam's spillway will be built is up to 95 ft high and contains several different strata of rock ranging from soft to hard. To place rock anchor bolts up the face of this cliff, we figured we would have to drill 13,000 lin ft of anchor and 6,000 lin ft of drain holes from 10 to 14 ft deep and on 4-ft centers.

The face of the cliff is so nearly vertical that it was obvious we would have to work out some efficient way to drill these holes or wind up the job owing ourselves money.

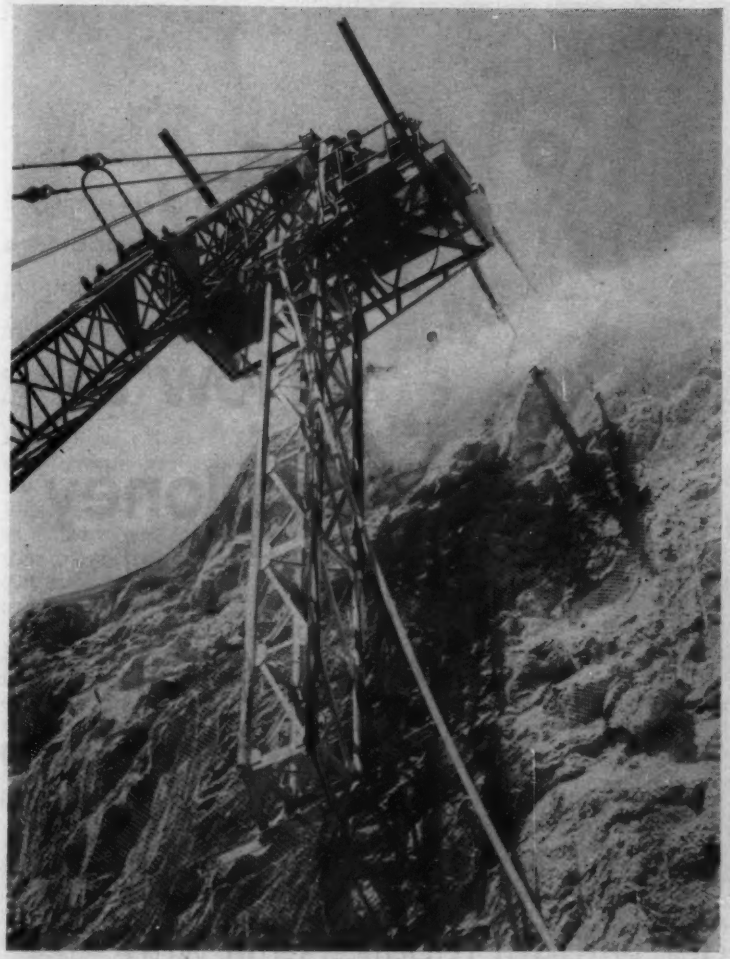
Best solution seemed some sort of elevator drill rig capable of mass drilling the holes with a minimum of set-up and breakdown time. We decided to mount two drills on a platform that rode up and down a tower suspended from a crane boom. We're not equipment designers; so we called in Andy Anderson and Red Peckham, drill salesmen for Joy Manufacturing Co., and explained our idea.

They listened to our plan, then returned to their office to talk over the idea with Joy engineers. Soon after, they gave us a preliminary sketch. It wasn't quite right, so we worked out some changes with the Joy engineers. End result was a plan that we turned over to George Yarocki of the Torrington Metal Products Co., a machine shop near our home office.

The tower they made for us is 30 ft long and 4 ft square. It is built of 5-in. heavy duty, double-wall steel pipe held together by steel crossbracing. A double steel flange at the top fits to both sides of the crane's boom-point pin.

The Torrington shop also fabricated the drill platform. This measures 16 ft long and 7 ft wide. It is made of 5-in. channel steel and decked over with steel grating. A Ty-Sa-Man bar that serves as a drill mount was welded to each end of the platform. Steel trusses at the bottom provide rigidity.

In Face of Cliff



WORKING HIGH—Crane's hoist cable holds drill tower suspended near the top of the boom as two Joy TM-450 drifters drill 3½-in.-dia holes with Joy carbide insert bits.

The platform then was slipped around the tower and four sliding mounts were added. These were 5-ft lengths of 6-in. pipe. The shop burned out a 3-in. slot down the length of each section so it could slide down a tower leg and into position on the framework of the platform.

Welding the pipe sections to the platform provided a slide that allows the platform to ride up and down the tower. A means of lifting the tower—an elevator cable mount—was provided by crossbracing the top of the slide sections and fitting to the bracing a steel flange to anchor the crane's lift cable.

We took the rig from Torrington and mounted two Joy TM-450 drills with MW-14 feeds on the 16 ft-long Ty-Sa-Man bar. These drills were to handle 15-ft Atlas Copco steels tipped with 3½-in.-dia Joy carbide insert bits.

We trucked the machinery out to the job and suspended the tower from the extended boom-point pin of a P&H crane. The crane pulled the elevator drill into position along the rock face. Then we extended the crane's hoist cable and attached it to the bracket fitted to the top of the drill platform. The crane's hoist line at this point could raise and lower the platform over the length of the tower. We ran a tagline from the bottom of the tower to a come along fitted to the front of the crane body. That enabled us to set the tower in any desired position. For added rigidity we fitted to the rig two 16-ft telescoping 3-in. dia steel pokes that run out and butt the drill platform up against the rock face.

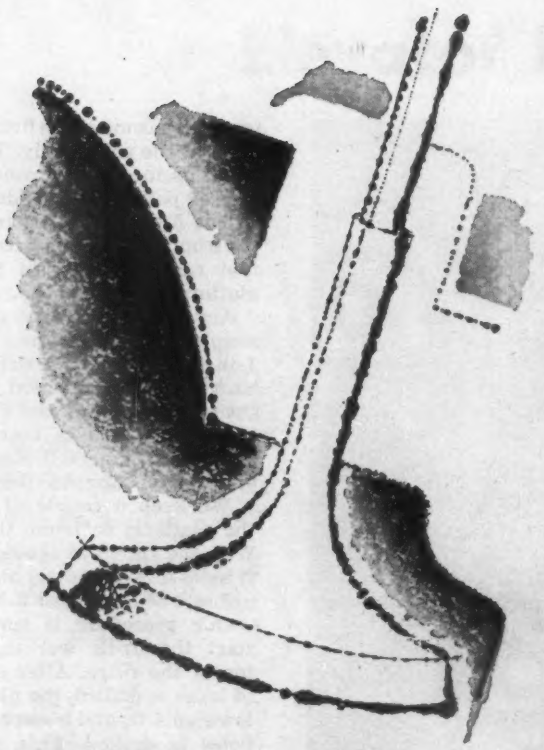
Air supply for the drill was a simple thing to arrange. We ran 3-in. hose from each drill to the back to a Y connection fitted to the platform. From the Y another long length of 3-in. hose runs to a 900-cfm Ingersoll-Rand portable compressor on the ground.

We keep a couple of men on the platform to nurse the drills. With the rig we're sending in 14-ft holes on 4-ft centers at an average rate of 500-ft per 8-hr day.

Our procedure is simple. We start the drills working at the top of the ridge. After each pair of holes is drilled, the platform is lowered 4 ft, and a second pair of holes is drilled. This continues until a set of holes is drilled down the entire face. The crane then moves over 5 ft, raises the platform, sets the tower angle, and a second double row of holes is drilled.

Representing the New England Division for the Corps of Engineers on the job is Earl Janett, resident engineer. Handling the job for us is Al Franzi, superintendent, and Doug Traub, engineer.

WORKING LOW—Platform rests at base of tower while drills mounted on Ty-Sa-Man bar work away. Tagline holding tower base runs to come-along on crane body.



Valves... Oil... and How to Save Money

Valves which open and close hundreds of times a minute can cause lost money, time and power when deposits and wear start to take their toll. Sinclair Tenol® Oils fight deposits and wear—help keep vital parts working longer without repair. Refill with Tenol now. Next time management asks how you've cut costs, tell them you've switched to Sinclair—and show them the results.

Call your Sinclair Representative for further information or write for free literature to Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.

Sinclair

Sinclair Tenol® Oils

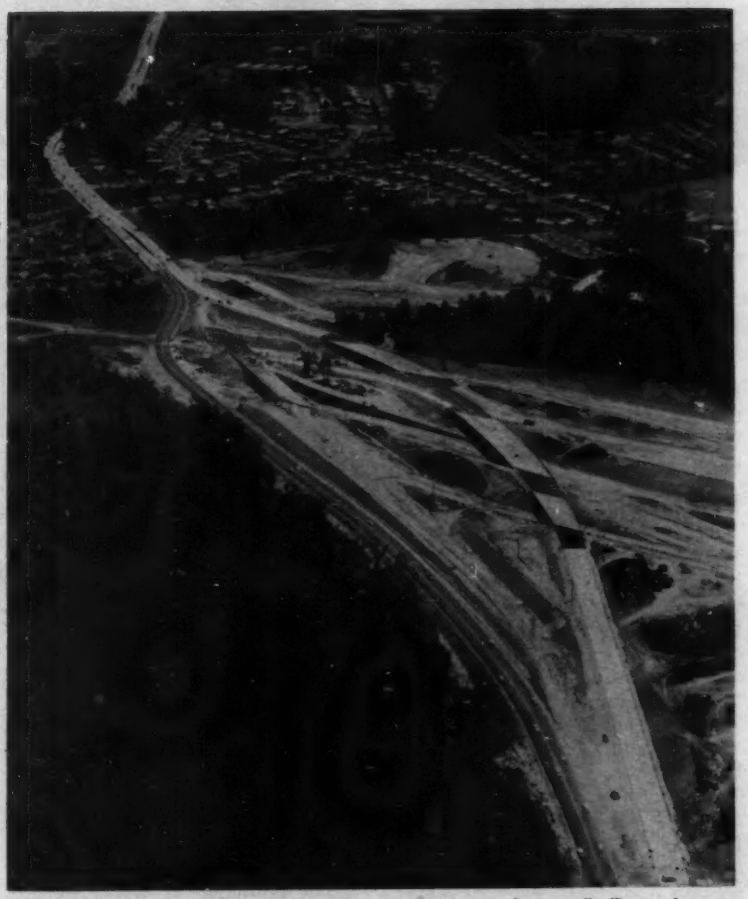
The Big Battle at Pook's Hill

This contractor manages to maneuver his men and equipment to build a major suburban highway while 30,000 cars roll through his tightly confined construction site every day.

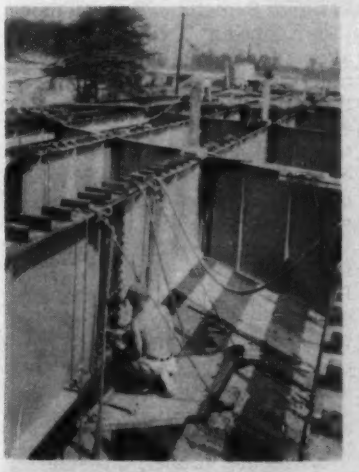
POOK'S HILL INTERCHANGE may never rival the spectacular historical structures around Washington, D.C. But it will stand as a monument to the contractor who is constructing it while 30,000 cars roll through his job site every day.

The project extends for 2.2 mi. In this limited space, the contractor is moving 446,000 cu yd of earth, placing 130,000 cu yd of topsoil to a depth of 4 in., erecting the interchange, and paving 2.1 mi of reinforced concrete dual-lane highway.

Wright Construction Co., Columbus, Ga., holds the $2.5-million contract for the interchange near suburban Bethesda, Md. It forms the intersection of three major highways.



HEMMED IN—Project is rimmed by park, homes, commercial areas. Traffic is about to be taken off asphalt paved detour (left) and put on concrete leg through middle of site.



SPLICING GIRDERS — Workman uses pneumatic wrench to tighten 65 bolts at each splice to 710 lb on each 1-in. shank.

How Traffic Moves

Wright's first job was to get into operation a highway leg that runs smack through the middle of the site. This leg contains three overpasses—all within 1 mi of each other. There are a total of six overpasses to be built on the project.

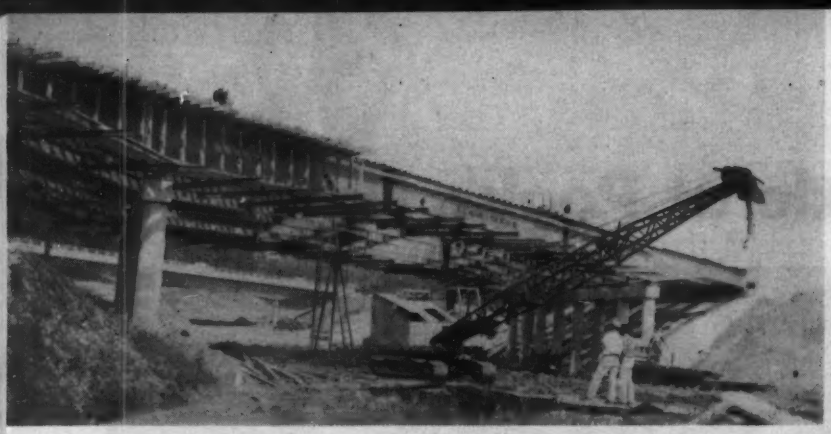
Constructing a detour around the entire project was impossible because it is surrounded by homes, commercial areas, and a park. Maryland State Roads Commision plans called for a short detour around the three large overpasses.

But Wright convinced engineers that a longer detour was feasible and preferable. To move traffic as far away as possible from the leg under construction, Wright built an asphalt-paved detour 3,600 ft long and 41 ft wide that skirted all six overpasses along the eastern perimeter of the project.

Even with this detour, Wright was cramped for space. The area was just large enough for four Caterpillar DW20 scrapers, two Allis-Chalmers push dozers, a grader, and a 50-ton rubber-tired compactor.

Upon completion of this leg, Wright abandoned the detour. Traffic is now moving over the newly completed leg. Heavy equipment is moving through the large overpasses under the traffic. In this way, earthmoving goes on.

Next to traffic, Wright's biggest headache is an unexpected formation of granite. Crews are drilling and shooting 8,000 yd of



FORM ERECTION—Needle beams that protrude from side of overpass support deck formwork. Beams are attached to underpart of girders with lag bolts and special hooks.

FORMING DEVICE—Hook-shaped unit (circled), cut from ½-in. plate steel, is welded to beams then slipped over flange of girder. Shimming adjusts beams.

POOK'S HILL...
continued

this material that is too hard for rippers to handle.

As compensation, Wright counts two favorable factors. Almost all the roads in the interchange are in cuts—only one is on a fill. And hauls are short.

New Forming Device

For overpass construction, Wright is driving 8,410 ft of steel bearing piles and 4,670 ft of cast-in place concrete piles. Joining of the girders, 6 ft at the web, requires 65 high-strength bolts to the splice. A pneumatic wrench tightens each bolt to a pressure of 710 lb at each 1-in. shank.

Job made devices, developed by Wright's bridge supervisor, Tate Guymon, save time in the erection and stripping of forms for the bridge decks. They are hook-shaped units cut out with torches from ½-in. plate steel and welded to the ends of the needle beams that support the formwork.

After welding beam and hooks together, workmen slip the hooks over the flanges of the girders. Then they pull the other end of the beams tight with lag bolts. Whenever necessary, they shim the bolts with wood blocks to adjust to curvature and spacing.

To strip, they reverse the procedure. First, they release the lag bolts, then slip the hooks from the flanges so the forms drop away.

Base Course

Specifications for bituminous paving on bridge approaches and some local roads call for a base course of crusher-run material mixed with calcium chloride in a pugmill at a quarry 6 mi away. Wright trucks this stabilized aggregate base course back to the job site, puts it down in three 4-in. layers, and compacts it with steel-wheel rollers before spreading the asphaltic surface.

For concrete, Wright erected a batch plant ¾ mi north of the construction site. It supplies a Koehring Twinbatch paver. The rest of the paving train consists of a Blaw-Know spreader and screed, bull floats, and hand-dragged burlap finishers. Five days after the sawing of transverse joints, traffic can roll on the highway.

Wright's project superintendent is William Kirk. L. E. McCarl is district engineer, and Reuben Cook is chief project engineer for the roads commission. Michael Baker Jr., Inc. was consultant to the Maryland State Roads Commission.

No Detour Possible

An equally exasperating situation occurs about a mile east of Pooks Hill, although it is not complicated by the construction of overpasses. Here, handicapped by heavy commuter and local traffic, Princemont Construction Co., Rockville, Md., paves in fits and starts to convert a two-lane winding roadway into a six-lane highway without the benefit of a detour.

To keep workmen and equipment busy on the $2-million job, the contractor sometimes paves 100-ft sections of a single lane at a time. Sometimes crews move the Koehring Twinbatch paver almost the entire length of the 2-mi construction site as often as three times a day. A centrally located batch plant feeds batch trucks in small quantities—about 5 yd. Length of hauls between batch plant and paver is never very long.

The old road runs back and forth across the right of way. Princemont works on either side of the traffic, rerouting it only where it crosses new work. Unpaved gaps occur at intersections and where utilities must be installed. These will be picked up later on.

To assure proper direction of traffic, Princemont employs several Montgomery County deputy sheriffs.

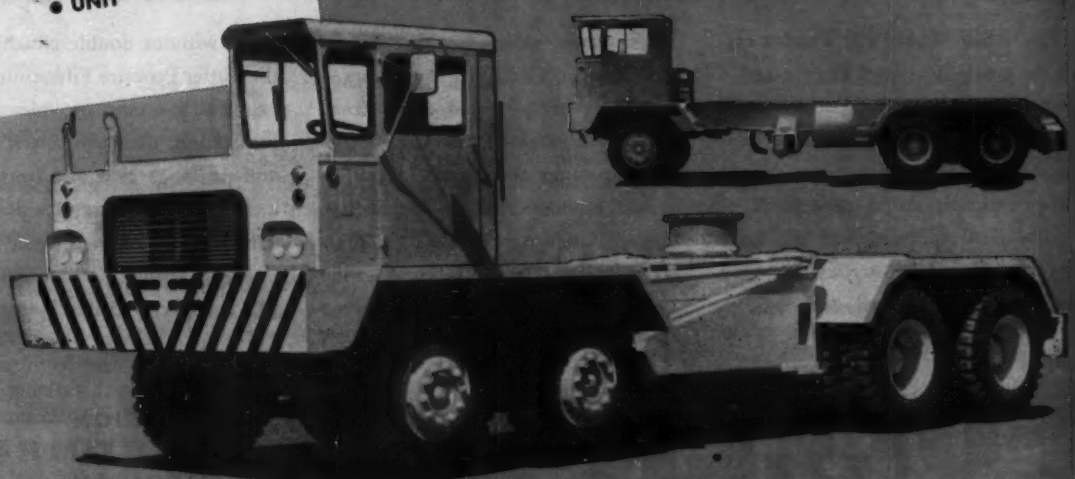
HENDRICKSON
CUSTOM CARRIER

HENDRICKSON supplies custom carriers for:

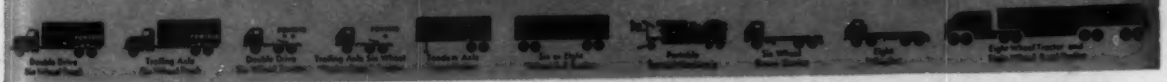
- AMERICAN HOIST AND DERRICK
- BAY CITY
- COLES
- KOEHRING
- LINK BELT
- MANITOWOC
- MARION
- NORTHWEST
- UNIT

Quality crane carriers . . . tailored to your particular needs. Not just assembled . . . precision crafted with top-quality components. A full line of carriers for cranes and shovels from 12½ to 60 tons . . . in four, six and eight-wheel models . . . gasoline, diesel, propane or self-propelled. For unmatched performance, durability and low-cost operation specify Hendrickson Custom Carriers.

HENDRICKSON MFG. COMPANY
8001 West 47th Street • Lyons (Chicago Suburb), Illinois



Equipped with famous Hendrickson Tandem Suspension, the standard of truck, trailer and equipment manufacturers.



Morrison-Knudsen Company, Inc., employs M-R-S Model 250 Tractors and Model 250 HW 40 cu. yd., struck—50 yd. heaped—Scrapers on this dam project in Leesburg, Ala. Morrison-Knudsen recently purchased 4 of the R-1550 ROADRANGER-equipped M-R-S Tractor-Scrapers and a 5th Model 250 Tractor used primarily for powering compaction rollers—the company's 3rd purchase of M-R-S 250 combinations in a year. The recent purchase brings the total for the Leesburg job to *eight* M-R-S 250 Scraper combinations and *two* M-R-S 250 Compaction Tractors.

Geared by FULLER . . .

50 YARDS, heaped, with R-1550 ROADRANGER

This M-R-S Model 250 Tractor employs a 600 hp diesel engine and a semi-automatic 9-speed Fuller R-1550 ROADRANGER Transmission to pull an M-R-S 250 HW Scraper with a heaped capacity of *50 cubic yards.*

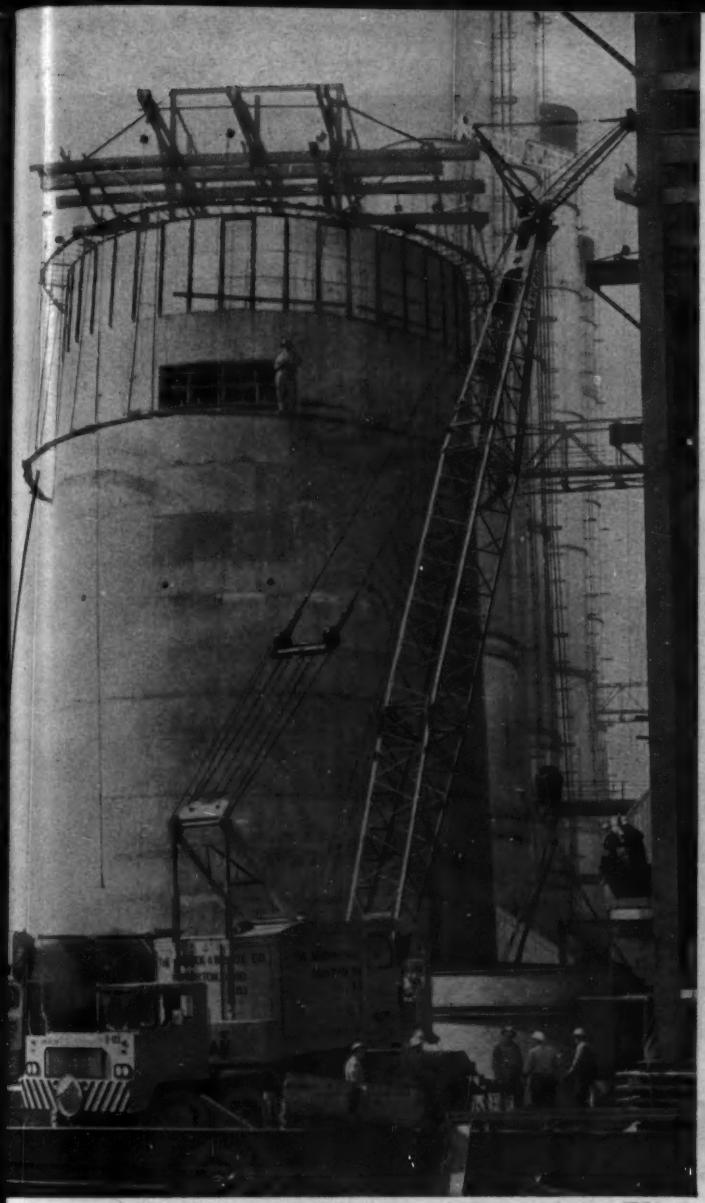
Standard equipment on the huge tractor, the R-1550 ROADRANGER features nine forward and two reverse speeds, selected with a single shift lever. With short, even steps—averaging 38%—between forward ratios, the engine can work in the peak hp range at all times, resulting in fast, economical scraper operation.

The Fuller Air-Powered Countershaft Inertia Brake on the R-1550 ROADRANGER permits quick, easy up shifts without double clutching, and the Fuller Pressure Filtration and Lubrication System provides positive lubrication, maintains clean gear oil and prolongs gear and bearing life.

For faster work cycles, lower fuel consumption, longer engine life, less operator fatigue, GREATER PROFITS . . . specify Fuller Transmissions.

FULLER — TRANSMISSION DIVISION — MANUFACTURING COMPANY
KALAMAZOO, MICHIGAN
Subsidiary EATON Manufacturing Company

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.
Automotive Products Company, Ltd., Brock House, Langham Street, London W.1, England, European Representative



Setting 8 Tons or 800 Tons...

AMERICAN AIR CONTROLS DO THE JOB SAFELY, SMOOTHLY WITH UNEQUALLED ACCURACY

Here is proof-positive of the all-around *superiority* of American Air Controls. Illustrated at right is the world's largest floating lifting device, an 800-ton capacity air-controlled American Derrick, owned by the J. Ray McDermott Co., Harvey, La. Setting the world's record lift in its builder's trials, this mammoth derrick has since provided safer lifting for scores of difficult jobs such as this one. Here American air controls were relied on to set in place a massive off-shore drilling platform in the Gulf of Mexico. Air controls were employed because their reliability has been proven time after time on the most delicate and costly heavy-duty jobs.

For handling smaller loads . . . your heaviest loads . . . you can count on American air controls for accuracy, with safety.

As demonstrated in the larger illustration, workmen have complete confidence in the reliability of an American 500 Series Truck Crane, *with Air Controls*, throughout a skillful powerhouse erection job.

Whatever your job demands are, there's no reason why you can't use American Air Controlled equipment for easier, safer lifting.

American Hoist has pioneered air control design and construction for almost three-quarters of a century. Today, American equipment is better than ever . . . better than any. Contact your American Distributor now for detailed and illustrated catalog information on American equipment.

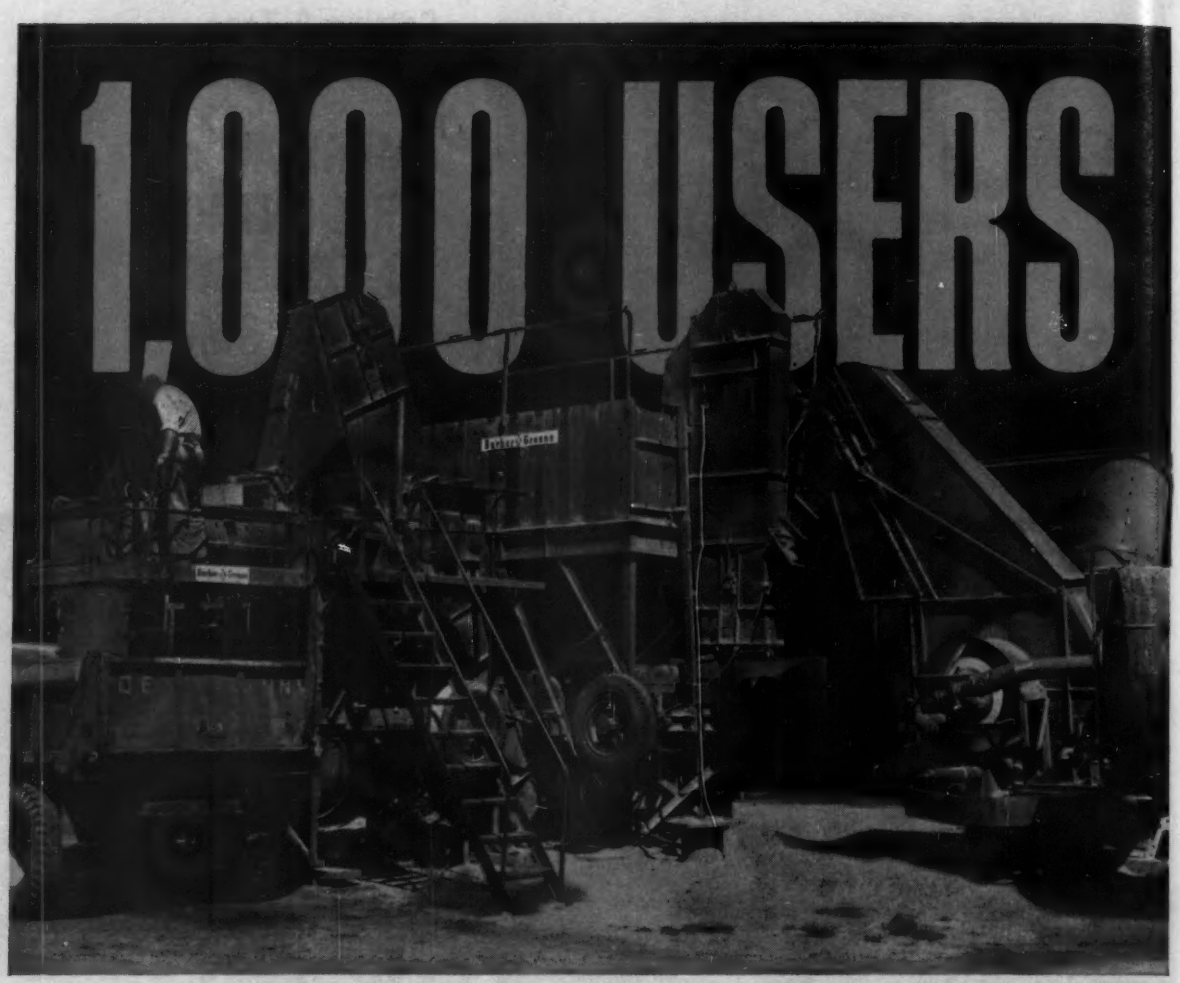
DERRICKS-HOISTS to 800 tons
REVOLVER CRANES to 400 tons

EXCAVATORS-CRANES to 2 yds.-60 tons
LOCOMOTIVE CRANES to 130 tons

AMERICAN HOIST
and Derrick Company
St. Paul 7, Minnesota

AMERICAN HOIST PACIFIC COMPANY
Special materials handling equipment

CROSBY-LAUGHLIN DIVISION
Drop forged fittings for wire rope-chain



mix for profit day after day

—with the low-cost Barber-Greene 840 Series

Barber-Greene's 840 Series continuous asphalt plant has proved a profit-maker for more than 1,000 owners. It offers unequaled versatility . . . unmatched portability . . . more mix for the money than any plant in its range. Here's why:

For Cold Mixes—all you need are mixer and calibrated feeder to produce capacities to 55 tons per hour.

For Intermediate-Hot Mixes—add a dryer to your mixer-feeder combination and produce any intermediate-hot mix at capacities to 55 tons per hour.

For High-Type Hot Mixes—simply add a gradation unit and you're set to meet even the toughest specs of highest-type mixes.

For Flexibility—you can't beat the 840 Series. All units are mounted on pneumatic tires for fast truck towing. Jacklegs speed plant setup, eliminate need for cribbing. You move only the components required to meet mixing needs . . . cover the entire range from cold mix to high-type multiple-aggregate mixes. Write for bulletin.

59-14-A

Representatives in Principal Cities of the World

Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U. S. A.

Plants in DeKalb, Illinois..Detroit..Canada..England..Brazil..Australia

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

ON SHORT HAULS—The contractor is using 13 Cat DW21's to move the fill on short hauls. Scraper at right on its return trip rolls along sloped bank of borrow pit.

Two Jobs for the Price of One

Flood control and road-building go hand in hand on this Ohio highway job. The contractor is digging a 30-acre borrow pit that he will turn over to the county as a flood control basin free of charge.

THIS HIGHWAY JOB carries an extra. An Ohio contractor landed the $3.7-million job by offering to build free of charge a 30-acre flood control basin.

It's not a matter of philanthropy although Lake County, Ohio, will get the badly needed flood control basin at no cost. The Horvitz Co. of Cleveland figured digging the basin was the cheapest way to get the 825,000 yd of fill they needed for the road job.

The 3-mi stretch of four-lane highway near Painesville, O., requires embankments ranging from 3 ft to a maximum of 17 ft. Average height of the embankment is about 7 ft.

Bringing in the necessary fill from a great distance would have been costly. Instead Horvitz conceived the idea of digging one big borrow pit close to the road and turning it over to the county for its flood control system at the completion of the job.

A permit from the local authorities was required to dig the pit. To get the permit the contractor had to agree to build a dike to a certain height around the pit, to provide a flood gate for proper control, and to fence in the entire property.

They consented to all this and landed the job. Their contract price was $267,000 less than the next lowest bid.

Long and Short Hauls

Haul distances range from a few hundred feet to as much as 2 mi. To move the dirt economically, Horvitz divided the earth-moving fleet into two parts.

Dump trucks handle the long hauls. Twelve International Harvester 12-yd trucks move the fill. A Manitowoc crawler-mounted

TWO JOBS . . . *continued*

shovel with a 3-yd bucket loads the trucks at one end of the pit. At the other end, 13 Caterpillar DW21 scrapers dig fill for the shorter hauls.

The soil is a silty clay. When dry, it is very hard. To push-load the scrapers Horvitz uses three Cat D9 tractors. Two of them work as push tractors exclusively; the third is equipped with a ripper and normally is not used for pushing.

ON LONG HAULS—Fleet of 12 International Harvester rear dump trucks hauls fill as far as two miles. A 3-yd Manitowoc shovel loads the trucks at one end of pit.

Four graders dress the fill on the embankment. One of them is an Austin-Western; the others are Caterpillars. Tank trucks water the fill, and three Chester double-drum sheepsfoot rollers handle compaction.

With this fleet Horvitz places as much as 20,000 yd of fill per two-shift day.

The Hole

The borrow pit is located close to the right-of-way near one end of the 3-mi. stretch. Newell Creek, a small stream, crosses the highway and empties into the basin. The stream channel is too small to handle all of the water during heavy rains. It often swells, causing extensive flood damage.

The retention basin will alleviate this. It will serve as a catch basin collecting excess water and permitting the stream to handle larger quantities of water. The stream channel will also be improved as part of the drainage system.

The water will be released from the basin in limited quantities that can be handled by the drainage system without flooding it. A drainage ditch will carry the water to Lake Erie.

When completed, the basin will cover approximately 30 acres and will have a storage capacity of about 200,000,000 gal. Depth will average about 20 ft.

Work was started on the contract last spring; target date for completion is July 31, 1960.

The men in charge of this job are C. E. Scott, resident engineer, and Charles Moderi, superintendent. Joseph Fry, chief engineer for Horvitz, and Al Kohn, general superintendent, originated the scheme for the borrow pit.

Add POWER to your economy drive...

RUGGED 56-HP VR4D — star performer on tough construction jobs.

New 56-hp **WISCONSIN-POWERED** saw cuts concrete and costs—automatically!

Powered by a 56-hp Wisconsin air-cooled VR4D engine, the C-560 is the most powerful longitudinal concrete saw ever to hit the pikes and airports. Built by Clipper Mfg. Co., of Kansas City, Mo., the C-560 speeds up and mechanizes sawing of control joints.

The new Clipper saw cuts fast and true without lead-off or center-line layout. And once started, *it keeps on sawing unattended* — even around curves — leaving the operator free to flush off slabs, and do other related jobs.

The rugged VR4D Wisconsin engine provides power to spare for running two blades at the same time. Faster cutting speed keeps jobs on schedule and extends service life of blades. The VR4D also propels the C-560 at speeds up to 35 fpm — forward and reverse.

Stepped-up power, say Clipper engineers, doubles cutting speed and sawing production — uses 19% less gas. The VR4D also provides all-weather dependability and gives the most hp-hours of service with the least amount of care.

Take a tip from Clipper—specify the 56-hp Wisconsin VR4D air-cooled engine for your heavy-duty high-power jobs. Write for Bulletin S-230.

WISCONSIN MOTOR CORPORATION
MILWAUKEE 46, WISCONSIN
World's Largest Builders of Heavy-Duty Air-Cooled Engines

ENGINEER'S FIELD REPORT

PRODUCT RPM DELO OIL

FIRM C. H. LAWSON, INC.

Using RPM DELO Oil heavy-duty engines outlast equipment

C. H. Lawson, Inc. operates 78 pieces of road building equipment ranging from new to 15 years old, all using RPM DELO Oil. Only one engine has ever required major overhaul and that was not due to lubrication. Firm's chief mechanic, E. C. Miller, says, "RPM DELO Oil has been used exclusively in all our heavy duty engines since 1944. In many cases, it has enabled engines to outlast the equipment." Euclid Earth Mover (above) gets a push from a bulldozer to provide extra traction in wet earth.

TD 24 International (left), one of firm's 12 bulldozers, helps clear the way for a Route 50 by-pass at Riverdale, Maryland. This two year old tractor has operated more than 4,000 hours without engine repairs. Company owner, C. H. Lawson (right), reports that RPM DELO Oil keeps the engines in his equipment in such good shape that—regardless of operating conditions—they average approximately 4 years or 10,000 hours service before even minor repairs are required.

Why RPM DELO Oils reduce wear—prolong engine life

- Oil stays on engine parts—hot or cold, running or idle
- Anti-oxidant resists lacquer formation
- Detergent keeps parts clean
- Special compounds prevent corrorosion of bearing metals
- Inhibitor resists crankcase foaming

For More Information or the name of your nearest distributor, write or call any of the companies listed below.

LUBRICATING OILS RPM DELO

TRADEMARK "RPM DELO" AND DESIGN REG. U.S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20

THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

STANDARD OIL COMPANY OF TEXAS, El Paso

THE CALIFORNIA COMPANY, Denver 1, Colorado

COMMENT
from the
BUTLER ENGINEER

Of World's Batching Records . . . Most that Ain't, Some that Are

For those who may be bemildered and bemused by the shouting and the tumult concerning world's records in road batching, let's get the record on records straightened out.

The past year has seen
"Contractor claims world's record of 4800 lineal feet of pavement in one day"
"World's Paving Record Set, 5080 lineal feet"

This is like a new "record" for a 5-minute mile. So when you see a new "record" announced — take another long, hard look and throw the article in an ashcan.

Here are the facts: more than a year ago a Butler TX-4 Roadbuilders Plant batched for 6029 lineal feet of 9 inch pavement 24 feet wide. Since then several contractors using Butler TX-4 equipment have beaten that figure by substantial margins. And no plant but the TX-4 has even come close.

But the real point is this: the full potentialities of high speed batching with the TX-4 have never been attained. First, because only three dual drum pavers were used. And only one cement elevator on the TX-4. The TX-4 is designed to accommodate two elevators — and thus equipped will easily and cheerfully feed four dual drums. No sweat. And the gain in production is enormous.

Further, the new TX-4 is remarkably improved in speed and in extreme accuracy.

We're getting set for the coming Ready Mixed Show at Chicago in February. We plan to show some really revolutionary answers to your problems.

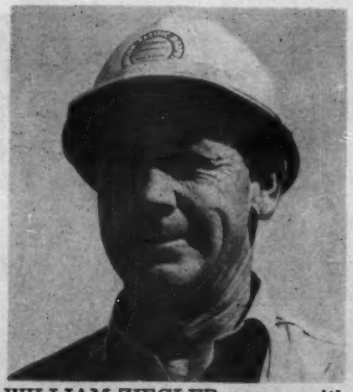
Don't miss it. See you there.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

Construction Men in the News . . .

Yuba



WILLIAM ZIEGLER, a man with an impressive record in west coast bridge construction, is the field superintendent for another span —the Benicia-Martinez Bridge across San Francisco Bay.

Ziegler works for Yuba Consolidated Erectors, Inc., a subsidiary of Yuba Consolidated Industries, Inc., which will build both the substructure and superstructure. The California State Highway Commission awarded contracts totaling $14,238,485 to Yuba for the project.

Ziegler joined Yuba in 1941. His bridge construction credits include the Interstate Bridge, Portland, Ore.; the 700-ft cantilever span across the Columbia River near The Dalles, Ore.; and the Richmond-San Rafael Bridge across San Francisco Bay.

And, for a change of pace, he was superintendent for the construction of the I. Magnin Building in downtown San Francisco.

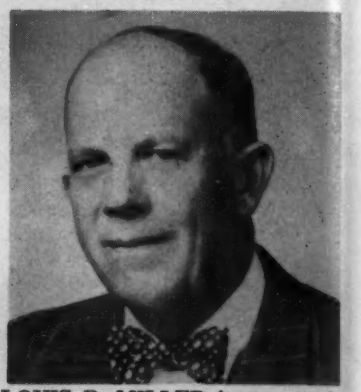
Ziegler served in the Marines for three years, supervising the contruction of air fields and other military installations.

Bechtel

CLARK RANKIN is the new vice president of Bechtel Corp., San Francisco. Based in Europe, he is responsible for Bechtel subsidiaries with offices in Paris, London, and The Hague.

Rankin, a civil engineering graduate of Stanford University, joined Bechtel 25 years ago. Since then he has managed many key projects, including oil developments in Kuwait and the construction of the Iraq petroleum pipeline.

Terminal



LOUIS R. MILLER is now resident manager for Terminal Construction Corp. at the firm's underground parking garage project at Newark, N.J. When it is completed, Miller can take credit for bringing to reality a $5,600,000 facility that had remained on the drawing board for 30 years.

Prior to joining Terminal, Miller worked as a trouble shooter for the Perini Corp. in Boston. In 1957-58, he was superintendent for the foundation of the Chase Manhattan Bank office building in New York City, constructed by the Foundation Co., sponsor of a joint venture.

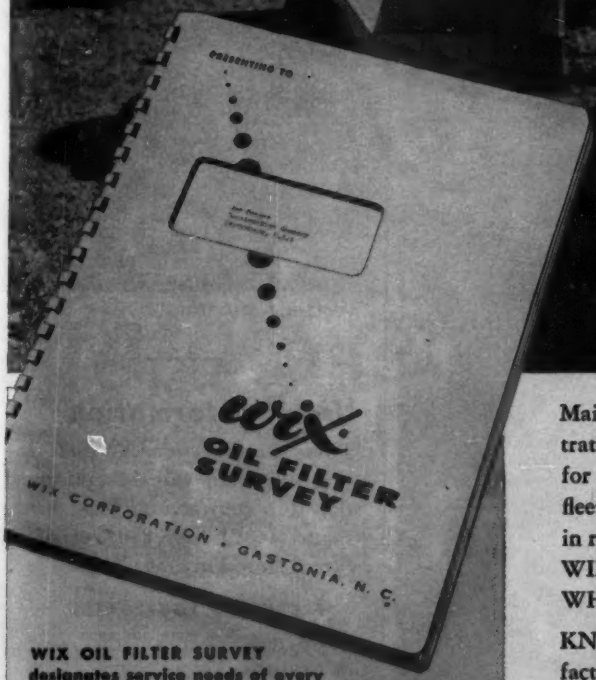
Stone & Webster

THEODORE E. CASSELMAN, JR., is the new manager of the New York office of Stone & Webster Engineering Corp. He was assistant engineering manager of the Boston office.

Casselman joined Stone & Webster in 1940 as a project manager.

continued on page 146

KNOW WHAT EACH VEHICLE NEEDS···
WRONG GUESSES CAN COST YOU PLENTY IN DOWNTIME



WIX OIL FILTER SURVEY designates service needs of every filter on each vehicle... provides inventory control record... survey conducted by WIX factory trained specialist at no cost to you.

There's a WIX Cartridge engineered for every engine in construction service including:

CATERPILLAR • INTERNATIONAL • LE TOURNEAU
ALLIS CHALMERS • DETROIT DIESEL • MURPHY
and ALL OTHER Construction Equipment

Maintenance figures show that WIX Prescription Filtration gives you a valuable PLUS in engine protection for every piece of equipment on the job. In fleet after fleet, this extra in performance shows up unmistakably in reduced wear, reduced downtime and reduced costs. WIX Oil, Air and Fuel Filters keep engines CLEAN WHERE IT COUNTS... INSIDE!

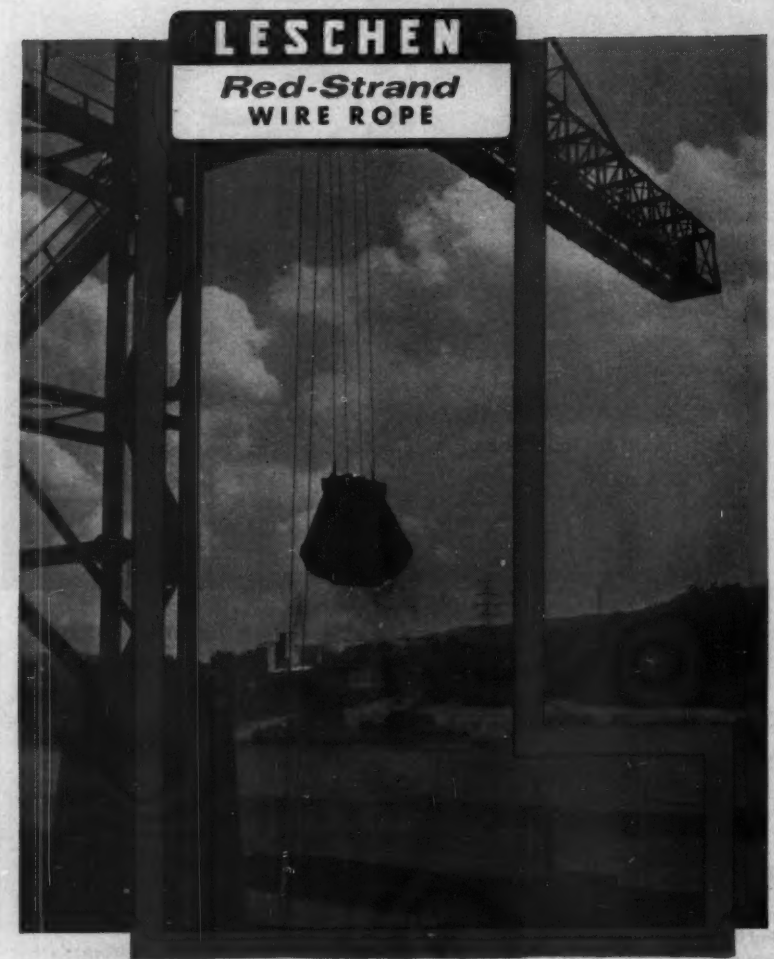
KNOW your engines and KNOW their needs. WIX factory trained experts will help you at no cost. A WIX Filter Survey spots the filter requirements of every unit in your spread... Oil Filters... Air Filters... First and Second Stage Fuel Filters... Hydraulic Filters ...and sets up a sound schedule for you. Here's better maintenance, fingertip inventory control and real economy... AND IT'S FREE!

wix® FILTERS

Write and get the facts on a WIX FREE Filter Survey and how you can have full filter inventory protection! Write today!

WIX CORPORATION • GASTONIA, N.C.
In Canada: Wix Corporation Ltd., Toronto
In New Zealand: Wix Corporation New Zealand Ltd., Auckland

when the going gets rough— give 'em "L"



When the load is on the clam shell, you'll be glad you rigged with *Leschen*—the wire rope that's the same top quality in every foot of every reel. At Leschen there are new machines with exclusive new continuous-flow technique. Try Leschen Red-Strand Wire Rope. Its uniform quality makes your operation safer, your replacement time farther in the future.

Leschen Wire Rope Division,
H. K. Porter Company, Inc.,
St. Louis 12, Missouri.

LESCHEN WIRE PORTER ROPE DIVISION

H.K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO, S. A.; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

MEN IN THE NEWS...
continued

Perini

CHARLES J. PATTERSON is the newly elected vice president for corporate relations of the Perini Corp., Framingham, Mass. He has served in the office of the president for the past 12 years, first as secretary, then, since 1957, as special assistant.

Shortly after his graduation from Notre Dame in 1947, Patterson joined Perini where he founded the Perini News and assisted in the preparation of advertising programs.

Useful Information

These *Construction Methods* reprints contain valuable information for contractors. Send your requests to: Editor, 330 West 42nd Street New York 36, N. Y.

PRODUCING AGGREGATES
60¢ each, 10 or more, 50¢ each

PAVING—
How to Get Best Results

EARTHMOVING—
An art and a science

CONCRETE MIXING AND PLACING
50¢ each, 10 or more, 40¢ each

PRESTRESSED CONCRETE
35¢ each, 10 or more, 25¢ each

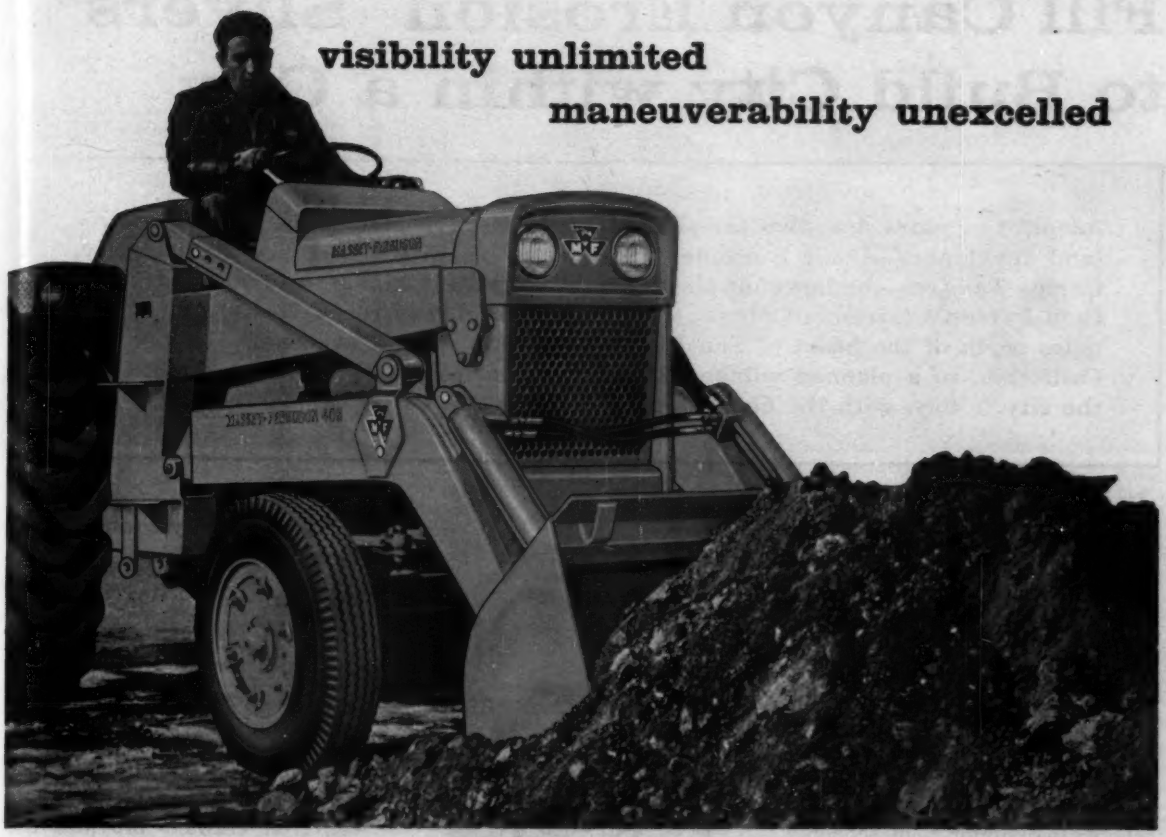
1959 COMPARATIVE SPECIFICATIONS SHEETS ON:

a. MOTOR GRADERS
b. CRAWLER TRACTORS
c. COMPRESSORS
d. SELF-PROPELLED SCRAPERS
e. TRACTOR-DRAWN SCRAPERS
f. STEEL ROLLERS
g. PNEUMATIC-TIRED ROLLERS

10¢ each, 10 or more, 8¢ each

visibility unlimited

maneuverability unexcelled



new MASSEY-FERGUSON 406

the BIG CHANGE *in tractor shovels*

Have loading power at your finger tips...speed and directional control at a touch of your toe...and see wherever you go—that's why this all-new, streamlined Massey-Ferguson 406 is the BIG CHANGE in tractor shovels.

Instant Reversing, all-around visibility, full 1 cu. yd. bucket, lets you get more loads, bigger loads, and outperform larger, more expensive machines. And, you can handle the precision, utility jobs more efficiently and economically. Low-thrust point, high reach, multitude of integrated attachments including the famous Davis Backhoe make it the most versatile, profit-producing rig in its class.

IT'S WORTH BUYING!

For a real eye-opener, let your Massey-Ferguson Industrial Dealer demonstrate this "years ahead" tractor shovel for you. Write for his name and illustrated literature.

a touch of your toe—away you go—forward or reverse

MASSEY-FERGUSON
INDUSTRIAL DIVISION
Block 1000 South West Street • Wichita 13N, Kansas

Fill Canyon Erosion "Slivers" to Build City within a City

Almost ten years ago, two far-sighted land developers—Louis Burgener and Carlos Tavares—began changing the then barren Clairemont Mesa, seven miles north of the heart of San Diego, California, to a planned village within the city. Today, with the help of Allis-Chalmers construction machines, Clairemont has grown to a city within a city. The present 45,000 to 50,000 population is expected to reach 70,000 by the end of 1960 . . . and eventually will be one of the largest planned communities in the United States.

Complete community facilities

The city of Clairemont, located within the city of San Diego, is being developed in units of 100 to 200 lots. It now contains, in addition to 12 to 13,000 homes (75% single-family), two shopping centers, one senior high school, two junior high schools, fifteen elementary schools, fifteen churches, two parks and a library.

A. H. Johnson handling current dirt work

A. H. Johnson, working for prime contractor R. E. Hazard Contracting Company, is using Allis-Chalmers torque converter crawler tractors and Allis-Chalmers motor scrapers on the rip-cut-fill work to prepare a unit of 100 sites. He is leveling, filling and terracing lots and cutting streets in material that runs from sandy loam to a tough conglomerate of cobblestone and dobe. In the early stages of this unit, the material was so abrasive even the toughest ripper teeth had to be replaced frequently.

A. H. Johnson
Lakeside, California

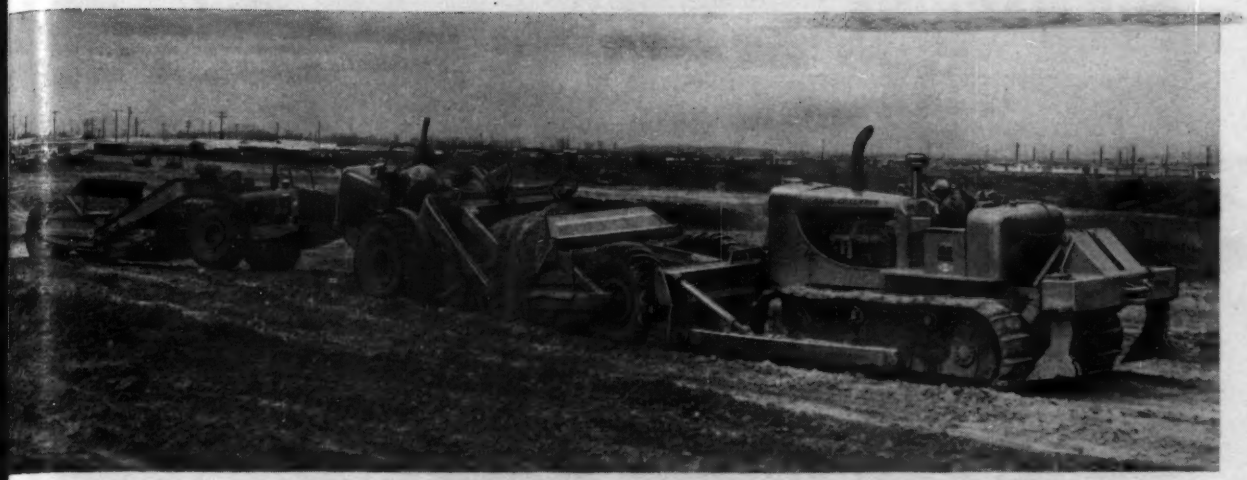
Fills carefully compacted

Clairemont Mesa is cut by canyons with eroded "slivers" along each side. These slivers are filled and compacted . . . carefully checked every foot of lift . . . to create good, stable homesites along trim, scenic canyons.

Johnson's Allis-Chalmers torque converter crawlers provided the big power necessary to rip the toughest material on the mesa. They also push-loaded the Allis-Chalmers motor scrapers. Most of the motor scrapers are hydraulic

An Allis-Chalmers TS-360 takes a load into one of the numerous sliver fills. The 5x5 compactor, right, is constantly at work on the fill, which is checked every foot of lift.

AC ...move ahead with



One of Johnson's Allis-Chalmers hydraulic scrapers is push-loaded by a turbocharged HD-21. These fast-loading motor scrapers used their hydraulic down pressure and short turning radius to good advantage in the tough material and tight fills.

units which used their double-acting bowl jacks to good advantage biting down into the material and getting loads that paid on every pass. Double-acting bowl jacks are available as standard equipment only on Allis-Chalmers hydraulic motor scrapers.

The fact that Johnson's Allis-Chalmers TS-260 motor scrapers feature 90-degree steering and require less turning area than any make of comparable size (less than 31 feet) was a real timesaver in the close quarters of the numerous sliver fills.

A. H. Johnson has found . . . as thousands have . . . that Allis-Chalmers construction machinery is designed with the tough jobs in mind. Select the correct units for your next jobs and see them in action. Your Allis-Chalmers construction machinery dealer will arrange the details. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

The 225-hp, turbocharged HD-21 rips the cut to speed loading.

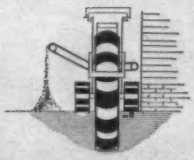
HD-21 225 net engine hp—torque converter drive **TS-260** 230 hp, 17 yd heaped

ALLIS-CHALMERS...power for a growing world

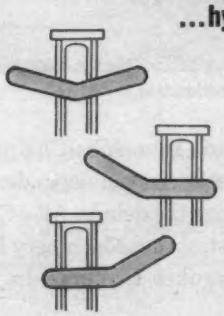
THE MACHINE / for distribution digging

...the new Cleveland J-20 trencher

- less than 5' wide over its crawlers
- digs 13" to 24" wide, down to 5' 6" deep
- puts 24" trench within 20 inches of a parallel wall
- maneuverable full crawler mounting... perfect balance and stability, easy on lawns and sidewalks
- fast, accurate, clean, dependable... nothing digs trench like a Cleveland



Cleveland's unique new V conveyor
...hydraulically shifted... independently driven



- digs past poles, trees, shrubs... places spoil where needed — without interrupting other operations
- lever at operator's seat controls hydraulic shifting and positioning of conveyor
- dual independent hydraulic drive gives operator fingertip control of conveyor belt direction and speed — independent of all other operations
- self-contained hydraulic motor and planetary gear drives in each head pulley eliminate all conveyor chains and sprockets
- provides constant elevating angle for faster, higher spoil discharge
- Maximum clearance under digging wheel rims permits higher heaped loads without clogging
- conveyor design reduces rolling and tumbling

world's finest trencher crawlers

...double flanged sprockets, rollers, wheels... drives on each end of 1½" diameter hardened pins... sealed ball and roller bearings... 1,000 hour lubrication... a tremendously long-lived, easy-rolling track.

hydraulic crumbing shoe

...optional, extra... pivots upward... fingertip control makes crumbing shoe advantages practical in crowded digging conditions.

engine • crawlers • hoist • wheel
crumbing shoe • conveyor speed-direction-shift / *Every operation controlled at operator's seat*

The CLEVELAND TRENCHER Co.

20100 ST. CLAIR AVE. • CLEVELAND 17, OHIO

Good ..... Everywhere

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distribution, sales personnel and other activities.

Distributor Appointments

Bucyrus-Erie Co.: Wright-Thomas Equipment Co. of Charleston, West Va., has been appointed crane-excavator distributor. The territory of the new dealer covers all but a small portion of West Virginia.

Radio Corporation of America: The following manufacturer's representatives for RCA mobile communications equipment have been named: J. F. Ottmar Co. of Spokane, Wash.; Mobile Radio Service & Communications Corp. of Shreveport, La.; Miami Mobile, Inc. of Miami, Fla.; Rocky Mountain Communication Co., Inc., of Denver, Colo.; and Modern Electronics Laboratory Corp. of Syracuse, N. Y.

Worthington Corp.: Contractor's Equipment Rental Co., Inc., of Reno, Nev., has been appointed distributor of construction equipment in the state of Nevada. Baker Equipment Engineering Co., Inc., of Charleston, West Va., has been named distributor for West Virginia.

Highway Equipment Co.: Girard Machinery & Supply Co. of San Antonio, Tex., and J. D. Coggins Co. of Albuquerque, N. M., have been named distributors.

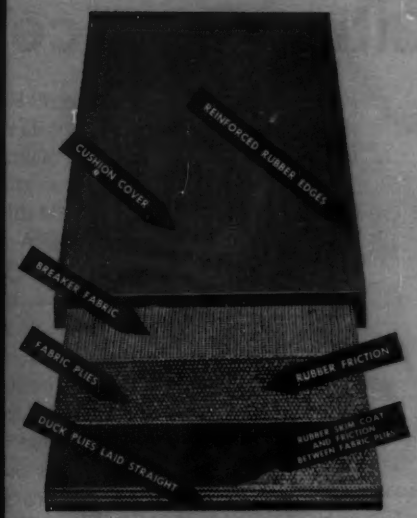
Yale & Towne Mfg. Co.: Belmont Equipment Co., Inc., of Evansville, Ind., and Southern Industrial Equipment Co. of Miami, Fla., have been named franchise representatives for Yale industrial lift trucks and tractor shovels.

Diamond T Motor Truck Co.: The following new dealers have been appointed: Max W. Smith of Ballietsville, Pa.; Rocky Mount Trading Co., Inc., of Rocky Mount, N. C.; Empire Equipment Sales of Kalispell, Mont.; Dean Powers Company of Rockford, of Rockford, Ill.; Truck and Trailer

Going up --- new highways, bridges and buildings

300 tph of aggregate goes up on the Acme-Hamilton conveyor belt to the concrete mixing plant . . . and from there to the hundreds of construction jobs served by the Parkway Concrete Co., Trenton, N. J. "This Barber-Greene Conveyor and Acme-Hamilton belt have given me better service than any other I have used" says Frank Talarowski Parkway's general manager.

BETTER SERVICE at lower cost is assured when you make sure your belting is Acme-Hamilton. Whatever your conveying problem, A-H can solve it with a proven belt from its complete line, that will do a "Custom built" job for you. For a complete explanation of A-H belt construction and types, write for our "check-your-belt" Catalog.



Acme Hamilton

MANUFACTURING CORPORATION, TRENTON 3, N. J.

Divisions: Acme Rubber Mfg. Co. • Hamilton Rubber Mfg. Corp.

ATLANTA • CHICAGO • DETROIT • HOUSTON • INDIANAPOLIS • LOS ANGELES • MILWAUKEE • NEW YORK • PITTSBURGH • SALT LAKE CITY • SAN FRANCISCO • SEATTLE

Flatbed Trailers owned by Rego help speed heavy equipment to job site. Wherever there's a job underway around Bristol you're likely to find Rego . . . and you're sure to find Cities Service fuels and lubricants.

In Bristol:

It's Rego for Roads Cities Service for Rego!

For 25 years, the town of Bristol, Rhode Island, has called upon Rego & Sons to build and repair its roads . . . and Rego has called upon Cities Service to fuel and maintain all equipment.

"Just as we had to prove our worth to Bristol, Cities Service had to prove its worth to us," says Manuel Rego. "We started out 25 years ago with just two trucks. A couple of breakdowns could have put us out of business. But we had trouble-free maintenance then and we've had it ever since, using Cities Service products.

"Today, we've always got six or seven jobs going at one time, jobs that keep our cranes, shovels, compressors and other equipment in constant service. We've built our reputation on hard work, and we're happy to have had hard-working lubricants to help us."

If you're looking for lubricants that can do more than their share of work, give more hours between overhauls than you'd rightfully expect, talk with a Cities Service Lubrication Engineer. Call the nearest Cities Service office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Builds Swimming Pools, Too! Rego & Sons do wide variety of jobs for Bristol and its citizens, who have the highest regard for the firm and its work. Crane pictured here uses Cities Service C-300 Motor Oil to extend periods between overhaul.

Manuel Rego expects the same quality from his lubricants that he puts into his work. Says he gets it from Cities Service. Rego always has six or seven jobs going and can't afford breakdowns or idle equipment.

SALES AND SERVICE...
continued

Sales Corp. of Savannah, Ga.; The Service Center of Mobile, Ala.; Merle Kelly Equipment Co. of Kansas City, Mo.

On the Sales Front

Clyde Iron Works: Michael J. Ucci of Valhalla, N. Y., has been appointed branch manager of Clyde's New York City office. He joined the company in 1948 covering the New England and New York territory.

Olin Mathieson Chemical Corp.: The following new appointments in the explosives operations are announced: John A. Clark, III, assistant director of sales—direct selling; L. A. Hoffman, western construction manager—contractor group; Mike Evans, Rock Mountain construction manager—contractor group; D. H. Weber, eastern construction manager—contractor group; Wendel Askew, manager Midwest region; W. G. H. Latham, manager Eastern region; Eugene Payne, Jr., district sales manager—Midwest region; and M. D. Picklesimer, district sales manager—Eastern region.

Superior Scaffold Co.: Fred Hendricks has been placed in charge of operations at Super-Rents, Inc., the company's newly organized scaffold rental agency in Stanton, Calif. Mark Griffith has been appointed district representative in the Mid-west.

Armco Drainage & Metal Products, Inc.: Charles L. Johnson has been named senior sales engineer in the Middletown headquarters building sales department. Herbert Clark, Jr., has been appointed Indiana sales manager. F. G. Hunt, Cincinnati area sales manager has been promoted to senior sales engineer for drainage and allied products at Middletown.

Koehring Co.: Edwin T. Goree has been appointed vice president in charge of sales for the Koehring Division. J. E. Chadwick has been appointed to head a new department of Koehring to integrate sales to national and fleet buyers. Howard D. Barnhart has been named domestic sales manager for Stardrill-Keystone products in the Buffalo-Springfield Co. Division. Tom McGill, Allen Climan, and Cliff Nicholson have

model 12 **PAYLOADER®**

Beats All Competition

Owners and their operators — all with years of tractor-shovel experience — are enthusiastic about the superiority of the Model 12 PAYLOADER. How its unit construction, rear-engine location, power-shift transmission and other revolutionary features give them greater all-around performance is evident in the following typical reports:

"Loads trucks almost twice as fast as our other tractor-shovel", says Anthony Oliver of Mohawk Constructors, Linden, N. J. "There is just nothing to compare with operator comfort".

"Outperformed two other popular makes", says Eddie Campbell, Dyer, Indiana — dug 36x40x5 basements in 3½ hrs. through 12-15 inches of frost. "There's better visibility to cut basements and I can cut within an inch all the way around".

"Backs out with heap loads without spilling", says Marvin Meier of S. F. Renaud, Denver, Colo. "The fastest basement diggers you can get. So easy to handle you can't find equipment that compares with them".

"Cuts basements in 2/3 the time", says D. L. Johnson of Pearson Construction, Joliet, Ill., "working alongside a unit of equal size". His operator says, "I do the same work in 5 hrs. that took 8 before — and with half the effort".

THE COMPLETE STORY of the Model 12's design, its superior performance and its greater profit potential for any excavating or grading job is fully explained in an attractive 8-page bulletin. Write for your copy today.

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
706 Sunnyside Avenue
Libertyville, Illinois

Send bulletin and other data on Model 12 PAYLOADER.

Name
Title
Company
Street
City State

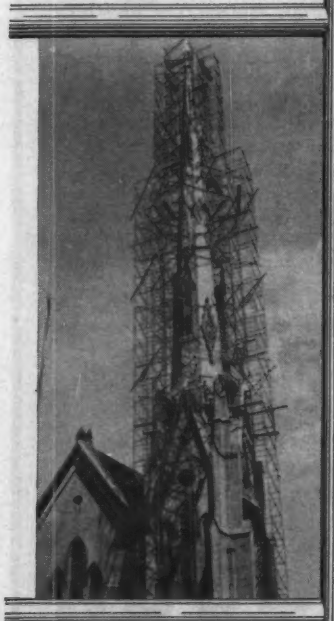
10-C-2

WACO

The COMPLETE, VERSATILE LINE of SCAFFOLDING and SHORING

New Waco accessories and engineering improvements make Waco the most complete and versatile line of equipment available for scaffolding and shoring.

This means one-source convenience and service for YOU. Waco distributors stock sectional steel scaffolding, rolling towers, steel post shores, a complete accessory line, and allied equipment.



For complete information check the yellow pages for your on-the-spot Waco Distributor, or write to

WACO MANUFACTURING CO.
5251 W. 130th St. • Cleveland 30, Ohio

Licensees: Armson Iron Works, Windsor, Ontario; Tubular Structures Corp. of America, Los Angeles, California

SALES AND SERVICE...
continued

been named district representatives for Canada in the Koehring-Waterous Ltd. subsidiary.

In the Main Office

Vulcan Materials Co.: Harold H. White has been appointed director, blasting practices and explosives research. His duties will include promotion of safe blasting methods and instruction and guidance in efficient handling of explosives.

Symons Clamp & Mfg. Co.: George F. Bowden has been appointed director of the research and development department. He replaces John E. Imonetti who has been promoted to assistant to the general sales manager.

The Timken Roller Bearing Co.: D. A. Bessmer has been elected president of the company to succeed W. E. Umstattd who is retiring. Bessmer was formerly executive vice president.

Associations

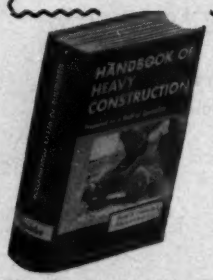
American Institute of Timber Construction: Robert W. Bower has been named to the newly created position of administrative manager of the Institute. He will head up office activities and serve as administrative assistant to executive vice president Frank Hanrahan.

Special Mention

R. G. LeTourneau, Inc.: The military's Joint Chiefs of Staff has selected Robert G. LeTourneau to receive the 1959 National Defense Transportation Association's Award, according to Secretary of Defense Neil McElroy. The award identifies Mr. LeTourneau as the person whose achievement contributed most to the effectiveness of the transportation industry in support of national security." This recognition stems primarily from Mr. LeTourneau's development of the "electric wheel" system for powering heavy equipment.

Tishman Realty & Construction Co.: Tishman is entering the industrial equipment leasing field by forming a wholly-owned subsidiary, Tishman Equipment Leasing, Inc. Among other items, the firm will lease roadbuilding equipment, trucks, and tractors.

New help for solving construction problems easier – faster



in this practical handbook of job-tested methods and data

Here is expert guidance in estimating requirements of a construction job, solving field problems, operating and maintaining equipment, and using modern materials. Over 1,000 pages of illustrations, tables, charts, and descriptions.

Just Published

HANDBOOK OF HEAVY CONSTRUCTION

Editor-in-Chief, FRANK W. STUBBS, Jr.
Professor of Civil Engineering, Purdue University

Prepared by a Staff of Specialists

1040 pages, 6 x 9, over 600 illus., $18.50

EASY TERMS: Only $6.50 in 10 days and $6.00 a month for two months

This master guidebook helps you handle heavy construction jobs more efficiently and profitably. It gives you tested methods—data on such vital factors as equipment costs and output—valuable checklists—and other essential information on every phase of construction. This time- and work-saving help is placed at your command by 36 top experts. They guide you in solving a wide range of construction problems involving such aspects as costs, materials, procedures, equipment, schedules, controls, and operations. In addition to serving as a complete guide for contractors, the handbook gives designers, engineers, owners, and others a sound working knowledge of all problems of a construction project.

Covers these and many other topics—
excavating and hauling • dewatering • concrete by intrusion grouting • bridge erection • drilling and blasting • pneumatic application of concrete • road paving • contracts • cofferdams and caissons • pile driving • organization planning • pipelines • foundations • heavy timber construction • tunnels • cableways • river diversion • slab and beam construction • reinforcing steel

10 DAYS' FREE EXAMINATION

McGraw-Hill Book Co., Inc., Dept. CM-10
330 W. 42nd St., N.Y.C. 36

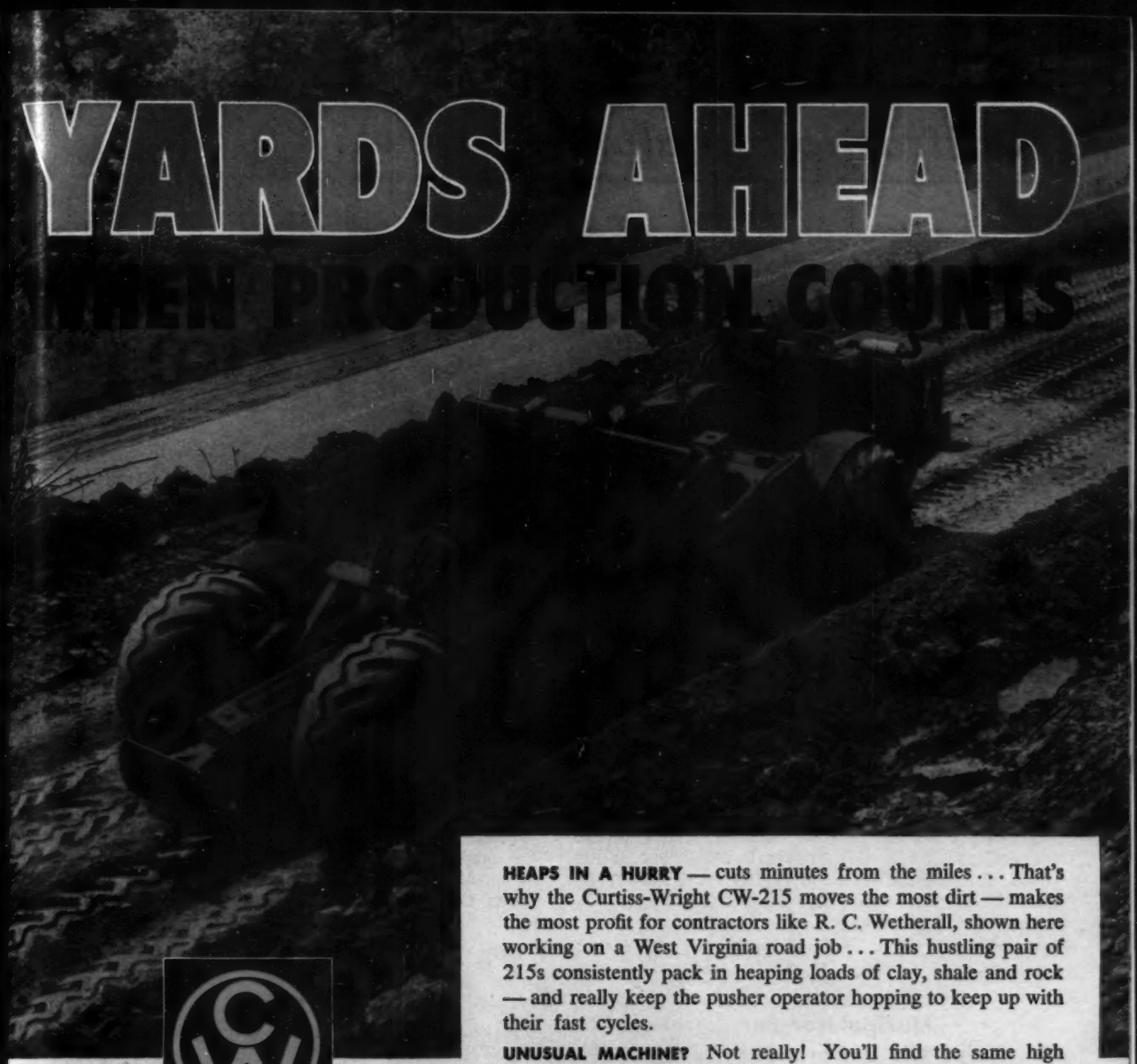
Send me Stubbs' Handbook of Heavy Construction for 10 days' examination on approval. In 10 days I will (check one) ☐ send $18.50, plus few cents for delivery costs or ☐ $6.50 in 10 days and $6.00 a month for 2 months. Otherwise, I will return book postpaid. (We pay delivery costs if you remit with this coupon—same return privilege.)

(Print)
Name .....
Address .....
City ..... Zone ..... State .....
Company .....
Position .....

For prices and terms outside U.S., write McGraw-Hill Int'l., N.Y.C. CM-10

YARDS AHEAD

WHEN PRODUCTION COUNTS



HEAPS IN A HURRY — cuts minutes from the miles . . . That's why the Curtiss-Wright CW-215 moves the most dirt — makes the most profit for contractors like R. C. Wetherall, shown here working on a West Virginia road job . . . This hustling pair of 215s consistently pack in heaping loads of clay, shale and rock — and really keep the pusher operator hopping to keep up with their fast cycles.

UNUSUAL MACHINE? Not really! You'll find the same high performance in the entire CW line — from the 7 cu. yd. CW-27 to the big CW-226, largest two axle scraper on the market. Check any model against your job requirements . . . put "Yards Ahead" performance to work for you.

AD NO. 52-48

SOUTH BEND DIV. CURTISS-WRIGHT CORPORATION, SOUTH BEND, INDIANA

CURTISS-WRIGHT MODEL

215

CW-215 SELF-PROPELLED SCRAPER

Capacities: 15 cu. yds. struck, 21 cu. yds. heaped, 42,000 pound rated load

SALES • SERVICE • PARTS
at your
CURTISS-WRIGHT DISTRIBUTOR

SOUTH BEND DIVISION

CURTISS-WRIGHT

CORPORATION

SOUTH BEND, INDIANA

Construction Equipment News...

Flatbed Utility Truck Is Practically All Deck

This truck has 195 sq ft of deck; the one-man cab covers only 5.6% of the overall area. The White 3022 Util-I-Deck rides on a 163½-in. wheelbase, but it can carry a beam as long as 40 ft.

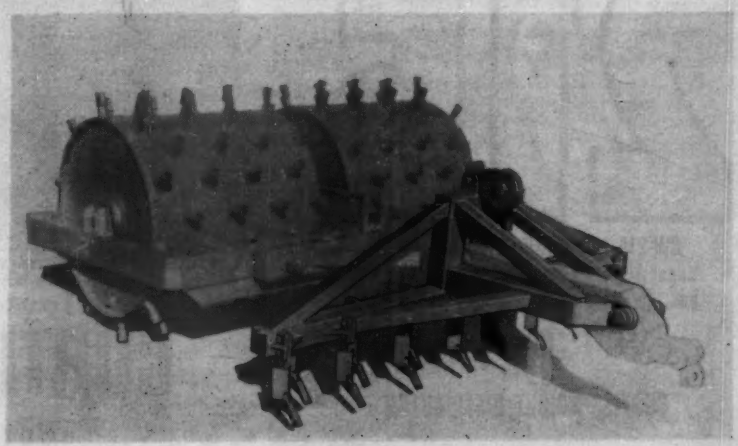
Deck width behind the cab is 96 in.; alongside the cab it is 62 in. The cab and adjacent deck tilt to permit access to the 145-hp engine.—**The White Motor Co., 842 E. 79th St., Cleveland, Ohio.**

Manipulator Bar Helps Mix Uniform Fill

Sheepsfoot rollers can now be equipped with a manipulator bar that rides the roller's drawbar and rips into the fill at a preset depth. It helps bond new fill to previously laid material.

Five depth adjustments permit a maximum penetration of 15 in. A rear cable control from the tractor operates the bar. It has 14 shanks and replaceable teeth. Standard shanks are 1x3 in.; other sizes are optional.

The unit weighs 1¼ tons and can be disconnected from the sheepsfoot drawbar by removing the draft bolt. Tractor-mounted units are also available.—**McCoy Co., 6000 Colorado Blvd., Denver 17, Colo.**



Scraper Gets V-8 Diesel Engine

Bigger capacity and more power are features of the V-Power C Tournapull. Power plant is a 270-hp GM 8V-71 diesel. It is the first V-8 diesel in an earthmoving scraper. Parts are interchangeable with other GM series 71 engines. The transmission has five gear ranges. Top speed is 27 mph. Heaped capacity of the scraper is 20 cu yd.—**LeTourneau-Westinghouse Co, 2301 NE Adams St., Peoria, Ill.**

Produces 500 Tons per Hour

The Cedarapids Super Commander crushing and screening plant can produce 500 tons of aggregates per hour, yet it is small enough to travel on the highway when fitted with a third axle.

A larger crusher and vibrating screen as well as bigger elevating return wheel and conveyors increase this plant's capacity over that of previous models. The plant can be fed by a ground-level or plant-mounted feeder and hopper.—**Iowa Mfg. Co., Cedar Rapids, Iowa.**

Sliding Weight Holepuncher Installs Wellpoints in Hard Soil

A sliding weight drives the Griffin holepuncher into hard ground where jetting is inadequate for wellpoint installation.

A crane-controlled cable positions the holepuncher with its cutting head on the ground. It is driven to approximately 1 ft below grade, and jetting water is pumped through the shank. The sliding weight is then allowed to fall on the striking plate driving the holepuncher into the ground.

The unit weighs from 1½ to 2 tons and the sliding weight adds another ton. This weight plus the impact of the sliding weight and the sluicing action of the jetting water enables the holepuncher to penetrate troublesome soil. A rotating plug is then turned to the open position and a wellpoint inserted.—**Griffin Wellpoint Corp., 881 E. 141st St., New York 54, N.Y.**

ONLY RAMSET

A single Ramset fastener holds 3-ton truck
Spring-like action of compressed steel surrounding the fastener creates a vise-like bond, developing amazing holding power

Ramset holding power test conducted by The Austin Co., engineers and builders, Cleveland, Ohio

offers austempered fasteners with such superior holding power

Even under the most demanding workloads, Ramset's austempered Red-Tip fasteners assure more holding power and greater fastener strength. Austempering, Ramset's high-heat slow-quench treatment, puts extra strength, toughness and dependability into every Ramset Red-Tip fastener.

Ramset's wide variety of fastener sizes puts the *right* fastener on each job—you don't have to "make-do" with off-size pins or studs. Ramset assures positive, guaranteed fastenings into tough steel, concrete or masonry faster and easier, and at lower in-place cost. Consider Ramset's many advantages and the "100-for-100" guarantee—call your Ramset dealer (under "Tools" in Yellow Pages) for details.

In addition to powder-actuated fastening, the versatile Ramset System includes Shure-Set® hammer-in tools for light fastening, and Ringblaster® heavy-duty kiln gun.

Ramset® Fastening System

WINCHESTER-WESTERN DIVISION • OLIN MATHIESON CHEMICAL CORPORATION
281-J WINCHESTER AVE. • NEW HAVEN 4, CONNECTICUT

Easy to Operate

Devices have been added to the 24-in. Master Midget power trowel to make its operation and handling easier and safer.

A blade adjusting switch is located halfway up the handle. It raises the blades for finishing or lowers them for floating. The switch can be operated while the machine is running.

A spring-loaded throttle and dead man control are located at the operator's fingertips. One man can carry the 70-lb unit by means of a carrying handle located in front of the engine. A 1.6-hp Briggs and Stratton engine powers the trowel.

The Midget's three blades can be adjusted for float, sweat, smooth, and hard finishes.—**Master Vibrator Co., 463 Stanley Ave., Dayton 1, Ohio.**

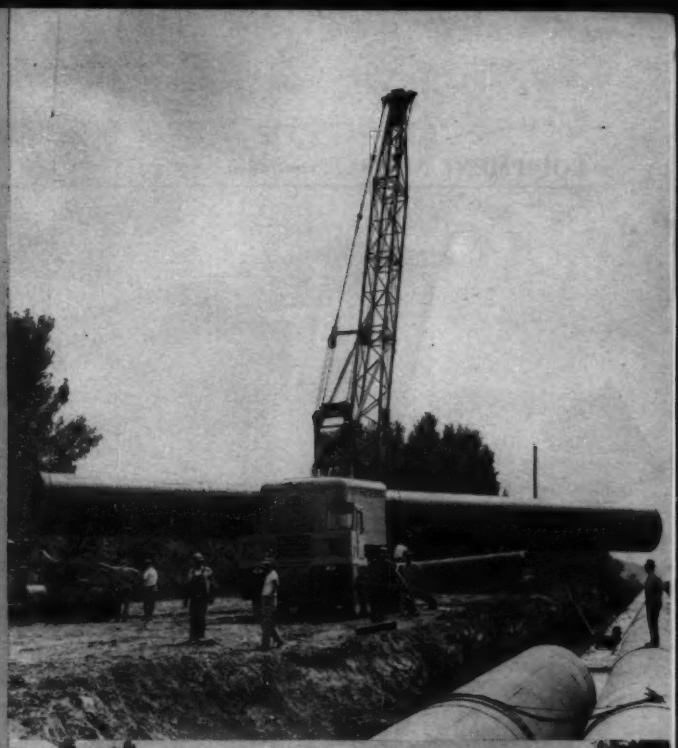
Toll Road Tractor

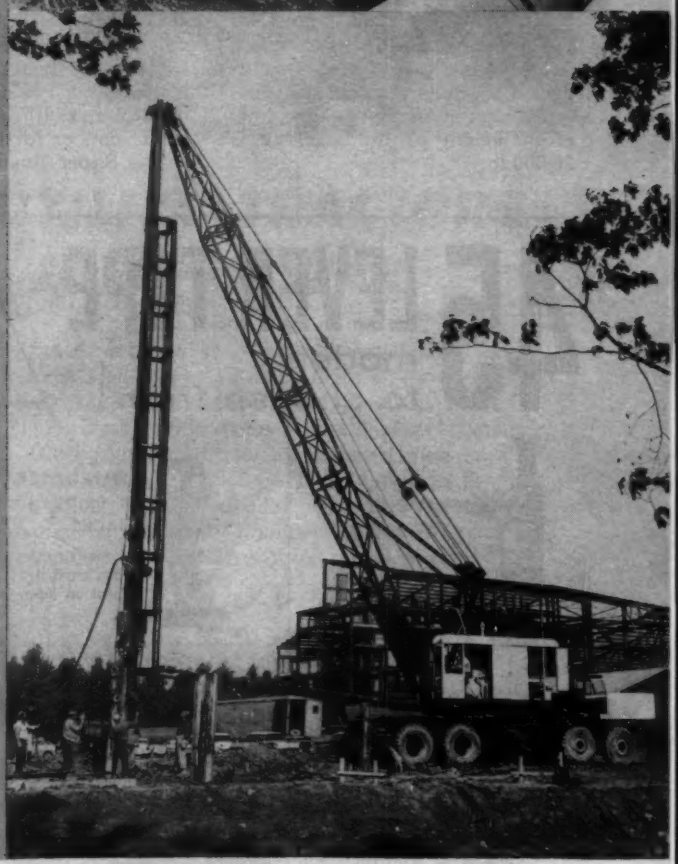
A diesel tractor specially designed for truck-train service on toll roads is rated at 127,400 lb gross combination weight. The International DCOF-405 tractor is a cab-over-engine, six-wheel unit. Wheelbase is 160 in.

Standard engine is a Cummins 335-hp NRTO-335 diesel. A 375-hp IH diesel is optional. This 817-cu-in. engine is the first IH-built diesel power plant ever available for the company's trucks. It is a six-cylinder, four-cycle, turbo-charged power plant. A 12-speed transmission is standard.

Two types of sleeper cabs are available with bumper-to-back-of-cab lengths of 72 or 80 in. — **International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**

NEW 60-TON LORAIN MC-760 MOTO-CRANE with 8 x 4 carrier "Power-Set" Outriggers





BIG PERFORMANCE ON THE JOB

• **Lorain Power-Set Outriggers** set up in less than 60 seconds, automatically adjust to uneven terrain, permit 40-second move-ups.

• **"Shear-Ball" turntable connection** eliminates all maintenance and adjustment. Only routine lubrication needed. Warranted for 10 years.

• **A 40′ basic boom** extends to 170′ with center sections. Square-tubular-chord design, new alloy steel . . . lighter, longer, stronger.

• **Front bogie** is Lorain-designed with solid equalizer beams to provide big "on-rubber" capacities.

• **Folding gantry, power operated,** lowers to carry boom in travel position without exceeding overall cab height.

• **Boom is raised and lowered** by positive and independent clutch control for extreme precision.

• **With a 230″ wheelbase,** an overall width of 135″, the MC-760 has a heavy, welded box-section chassis frame . . . no weave, no deflection under the heaviest loads.

FAST TRAVEL BETWEEN JOBS

• **Forward speeds** from 1.2 to over 37 mph. Air brakes on all 8 wheels.

• **17,000-pound rear counterweight** is easily removed with timesaving, hydraulic jacks to reduce road weight.

• **Removable outrigger boxes** and beams have fast-action, pin connections and hydraulic disconnects.

• **Hydraulic assist,** patented, centralized steering provides effortless driving, best front wheel tracking.

• **Low overall height.** A 14′ span between second and third axles meets most stringent bridge formulae.

• **Tandem drive rear axles.** Final reduction through planetary wheel hubs to relieve power train of strains.

For further details see your Lorain distributor.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN®

ON THE MOVE

PLANTS in Lorain, Elyria and Bucyrus, Ohio.

PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawler mountings from ⅜- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 1¾- and 2-yard models.

OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

Giant Machine Compacts Granular Materials

The Lima Super-Roadpacker is a roadbuilding giant. It can compact 1,500 tons of rock and sand screenings in one hour. Maximum gross weight of the machine is 26,900 lb.

Two 15-ft rows of vibrating shoes do the work. Each row consists of six shoes. One row is mounted ahead of the front axle; the other is behind it. End shoes in each row can be raised to reduce the width for working in tight spots or for highway travel.

The Super-Roadpacker is 26 ft 9 in. long. Width is 9 ft 10½ in., and height is 10 ft 2 in. The muffler and air intake extensions can be removed to reduce its height to a minimum of 8 ft 4 in.

Two engines, either gasoline or diesel, power the machine. One engine powers the vibratory system consisting of two 120-gpm hydraulic pumps—one for each row of vibrator shoes. Each pump can drive either or both sets of vibrator motors. The compaction rate is as high as 2,200 vpm.

The second engine propels the machine. It has two transmissions and tandem rear driving axles. Hydraulic power brakes with air boosters are standard on the four rear driving wheels. The front axle has hydraulic steering.

Top highway speed is 24 mph. The machine can compact at any speed between 26 and 268 fpm in either forward or reverse.—**Baldwin-Lima-Hamilton Corp., Construction Equipment Div., Box 427, Lima, Ohio.**

45 LEVER TYPE models to choose from!

THE WORLD'S MOST COMPLETE LINE
SIMPLEX LEVER JACKS

SINGLE ACTING, RATCHET LOWERING
11 Models, 5 to 20 tons capacity. Full capacity on toe or cap.

EMERGENCY & BRIDGE JACKS
2 Models, 15 tons capacity. Pivot on base.

GEARED JACKS
3 Models, 25 to 35 tons capacity. Side toe lift.

MINE TIMBER JACKS
4 Models (One has trip mechanism). Single and double acting.

POLE PULLING & STRAIGHTENING JACKS
3 Models (One aluminum alloy) 5 to 15 tons capacity. Standard of Bell System.

REEL JACKS
3 Models (One Aluminum alloy) 5 to 10 tons capacity. "T" Base.

TRACK (TRIP) JACKS
13 Models (Five aluminum alloy) Single and double acting.

BELT TENSIONING JACK
5 ton capacity.

Also Lever type, Cable & Wire Tensioning, Pipe Pushing & Pulling, Tie Remover, Tie Replacer, and Siding & Flooring Jacks.

Look for further information on Hydraulic and Screw Jacks in other advertisements.

TEMPLETON, KENLY & CO. · 2509 GARDNER ROAD BROADVIEW, ILLINOIS

ALLIS-CHALMERS UTILITY TRACTORS HANDLE BOTH JOBS BETTER

These tractors really spread out to provide exceptional stability. For example, the popular D-14 shown here has a wheelbase of over 85 inches. Tread width from 54 to 80 inches is power-adjusted. You can pull in the wheels to get into tight places... or spread them out to straddle wide trenches.

When it comes to loading or backfilling . . . you will like the way the D-14 Tractor switches from forward travel to backing up. SHUTTLE clutch let's you go with the lever — forward or back equally fast at the throttle speed you choose. There is no foot clutching . . . no clashing of gears.

Call your Allis-Chalmers dealer. He knows a dozen ways a D-14 or D-17 can help you keep your job on schedule. He'll demonstrate, too... name the day. Allis-Chalmers budget financing costs less than you may think.

ALLIS-CHALMERS

D-14 43-hp, 4,200-lb weight

D-17 63-hp, 5,300-lb weight

SOLD BY ALLIS-CHALMERS DEALERS EVERYWHERE

ALLIS-CHALMERS MFG. CO.
Utility Tractors and Equipment
Milwaukee 1, Wisconsin

Gentlemen:

Show me more about the new design Allis-Chalmers utility tractors and equipment.

☐ I'd like Literature ☐ A Salesman's Call
☐ A Job Demonstration

Name_____

Firm_____

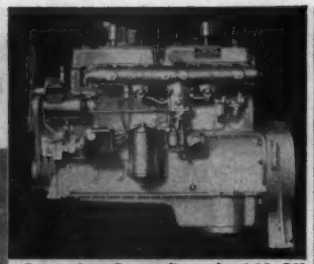
Address_____

City_____ State_____

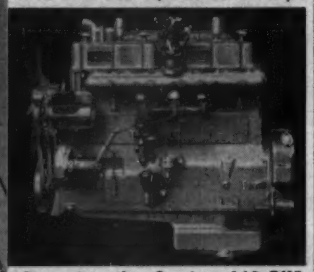
C-5

77,300 lbs

pick it up
...or
put it
down



Powering Crane (boom)—140-GK Waukesha Gasoline, six cylinders, 4½-in. x 5½-in., 525 cu. in. displ.



Powering the Carrier—145-GKB Waukesha Gasoline, six cylinders, 5¼-in. x 6-in., 779 cu. in. displ.

Get Bulletins 1548 and 1553

77,300 lb. section of press, for fabricating Bomarc surface to air missile parts, was picked up with 40' boom at 18' radius over the side and swung to rear, boomed out to 24' radius and lowered 10' to its base. Waukesha 140-GK engine with torque converter powers crane boom.

INSLEY TRUCK CRANE does it with

WAUKESHA POWER

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK TULSA LOS ANGELES

Factories — Waukesha, Wisconsin, and Clinton, Iowa

437

Tailgate Spreader

Hydraulic controls located in the cab regulate the width and depth of the spread. One lever controls the width, the other controls the flow of materials. The HI-WAY model TG tailgate spreader can cover spreading widths from 5 to 40 ft. One man operates the unit. It can be installed in any standard dump body 6½ to 8 ft wide.

The spreader handles sand, salt, chips, cinders, and calcium chloride for sealcoating work or ice control. A screw-type auger breaks up large lumps of material for uniform spreading.

A stabilizer bar keeps the 18-in. spinner in a level position regardless of the dump body angle. Low speed, high-torque motors power the hydraulic drives. — **Highway Equipment Co., 616 D Ave., N.W., Cedar Rapids, Iowa.**

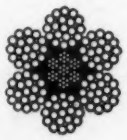
Sprinkler Tank

The Southwest STT-80 semi-trailer sprinkler tank has a capacity of 8,000 gal and can deliver at a rate of 1,500 gpm. It is designed for use with a Caterpillar DW20 or DW21 tractors and rides on large earthmover tires.

The unit's front, rear, and gravity spray bars can cover a width of 55 ft. Nozzles on front and rear pressure bars are manually adjustable for regulating the direction and volume of spray. Air-actuated valves, operated from the driver's seat, control the flow of water.—**Southwest Welding & Mfg. Div., Yuba Consolidated Industries, Inc., 3201 W. Mission Rd., Alhambra, Calif.**

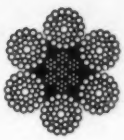
YOU CAN'T BARGAIN WITH SAFETY

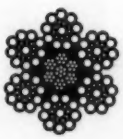
WICKWIRE ROPES FOR CONTRACTING EQUIPMENT



6 x 25 Filler Wire, IWRC

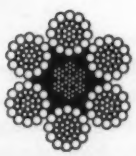
6 x 41 Filler Wire, IWRC





6 x 19 Seale, IWRC

6 x 31 Seale, IWRC



For detailed recommendations, write the nearest CF&I sales office and ask for WR 736.

For safety and performance . . . order CF&I-WICKWIRE *"job-designed" wire ropes*

The Image of CF&I—a giant steelman—stands for the rigid quality-controls and testing procedures that are carried out in the production of Wickwire Rope. This Image also reflects CF&I's ability to design a specific product to meet a particular need.

These are the very reasons why CF&I-Wickwire Ropes are both *safe*—as only a *quality* wire rope can be—and *suitable*—because they are available in a *complete range* of wire grades, types, sizes and constructions, designed to meet each industry's requirements.

Avoid the losses—due to injuries and wrecked equipment—that can occur when a "bargain" rope fails. Buy a quality wire rope that's designed for the job it must do—a CF&I-Wickwire Rope.

FREE! Send for new 32-page catalog, "CF&I Steel Products for the Construction Industry".

WICKWIRE ROPE

THE COLORADO FUEL AND IRON CORPORATION

CF&I STEEL

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte • Denver El Paso • Farmington (N. M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Odessa (Tex.) Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Tulsa • Wichita

In the East: **WICKWIRE SPENCER STEEL DIVISION**—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) New Orleans • New York • Philadelphia

6794-E

Contractor on new Ohio Freeway speeds tough project wit ulf fu

GULF MAKES THINGS RU

Take it from Bruns Coal Company, highway contractor of Zanesville, Ohio—Gulf makes things run better when the going's tough. Especially for their hard-working graders, scrapers, dozers, trucks.

Their contract calls for clearing, grading, drainage, paving, landscaping and bridge-building—on a 6-mile section of the new Ohio Freeway which will link Cincinnati and Conneaut, Ohio.

They're moving over 2,000,000 cubic yards of earth in the process . . . building two and one-quarter miles of ramps and interchanges . . . pouring over 129,000 square yards of 10" reinforced concrete pavement.

To keep things rolling, on a tight schedule, Bruns operates all their heavy-duty powered equipment with clean-burning Gulf fuels . . . lubricates them with clean-working Gulf oils and greases . . . and relies on Gulf for on-the-job service and prompt delivery.

Bruns has plenty of proof that Gulf makes things run

better. Th
output. Th
mum of m
down. And
How ab
makes thi
sentative
coupon fo
Guide"—t

On the job servicing with Gulf oils and greases is a regular routine between two 10-hour shifts, six days a week, for Bruns Coal Company on their Ohio Freeway contract.

Gulf man on the job checks fuel and lube requirements with Bruns executives. Left to right: Dennis Garwood, Chief Engineer; Lloyd Bruns, Vice President and Project Superintendent; Carl Bortles, Survey Chief; Frank Shindeldecker, General Superintendent; and William Stranko, Gulf Sales Representative.

Bruns Coal Company is the prime contractor on Project No. 37 of the Conneaut-Cincinnati Thruway. Bruns relies on Gulf fuels and lubricants to keep equipment rolling at top efficiency on this $5,000,000 job.

ulf fuels, lubricants and service . . .

RUN BETTER!

GULF

better. Their engines run clean with maximum power output. Their equipment stays on the job with a minimum of mechanical delays. Maintenance costs are held down. And they're on schedule.

How about your equipment efficiency? See how Gulf makes things run better. Just call a Gulf Sales Representative at the nearest Gulf office. Meanwhile, mail coupon for the latest edition of "Gulf Contractors' Guide"—the maintenance "bible" for heavy equipment.

GULF OIL CORPORATION
Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

Please send me the free "Contractors' Guide"

Name_____

Title_____

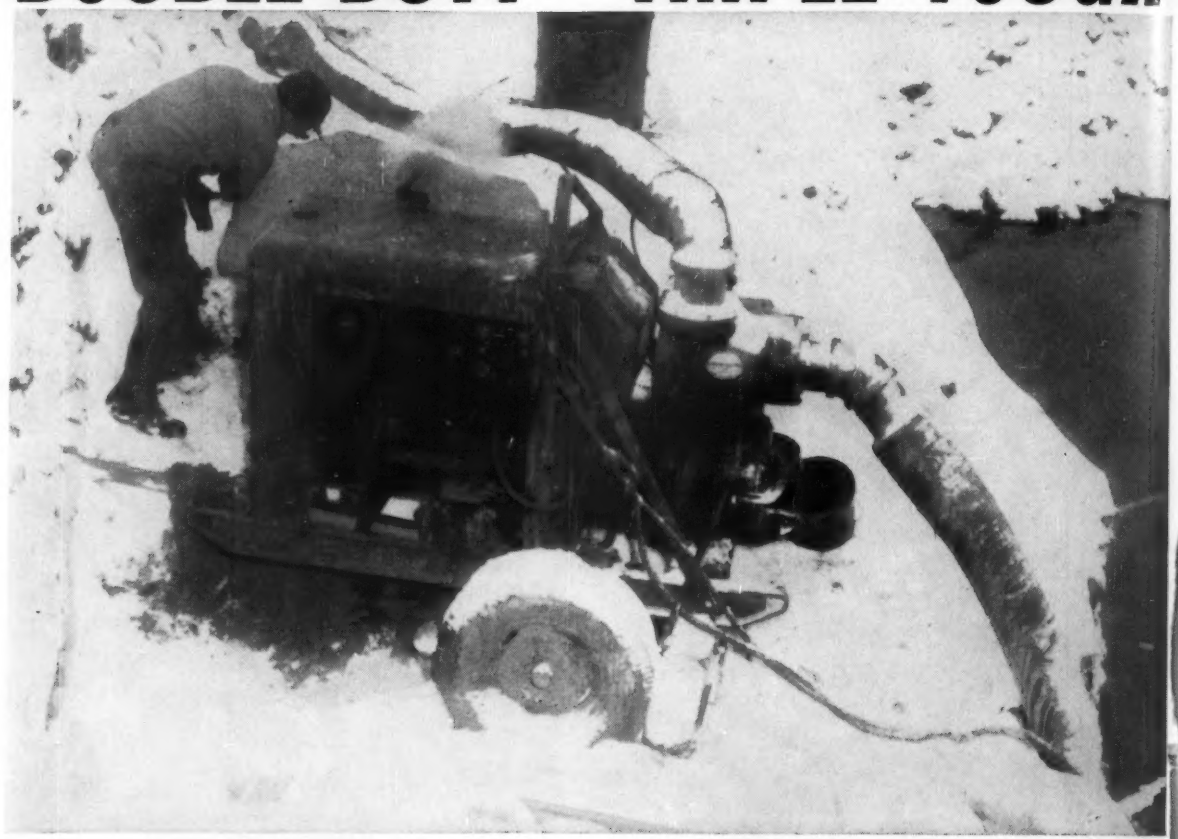
Company_____

Street_____

City_____ Zone____ State_____

SP-[illegible]

DOUBLE-DUTY • TRIPLE-TOUGH



Quaker Thermoid water-suction hose

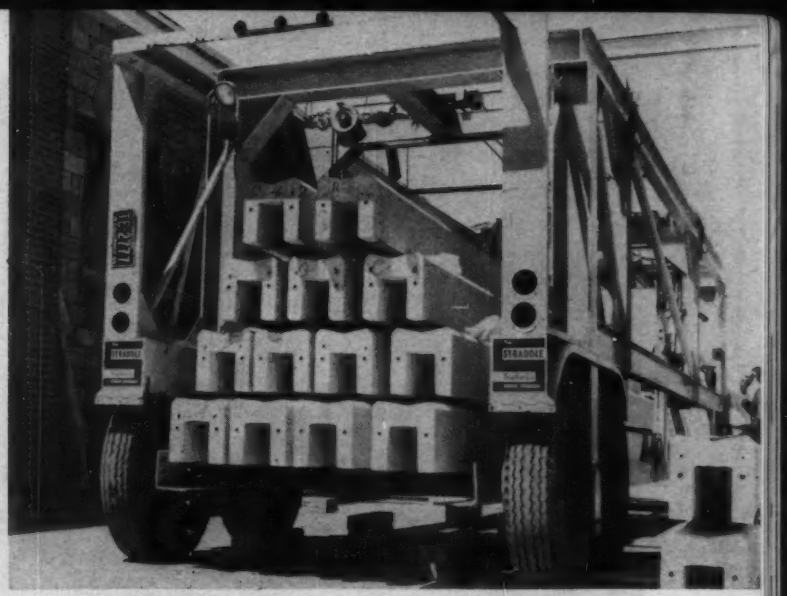
Whether you feed it light-duty or heavy-duty work, Thermoid-Quaker water-suction hose gives you long, champion-like service. It's sturdy enough to withstand full vacuum and direct connection to centrifugal and piston pumps. Yet it's light and flexible . . . well-muscled but manageable.

The toughness comes in three layers. First, a black, natural-rubber tube that resists mild acids and alkaline water . . . abrasive sand and grit. Second, a strong, durable carcass of heavy cotton cord interwoven with heavy-gauge, copper-coated spiral steel wire. Third, a black natural-rubber cover that stands up under the hardest knocks . . . combats abrasion, sunlight, and rough weather.

Ask your Thermoid distributor about Thermoid-Quaker water-suction hose (1½" to 4" ID, 50-foot maximum lengths). Or write to *Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Streets, Philadelphia 24, Pennsylvania.*

THERMOID DIVISION PORTER **H. K. PORTER COMPANY, INC.**

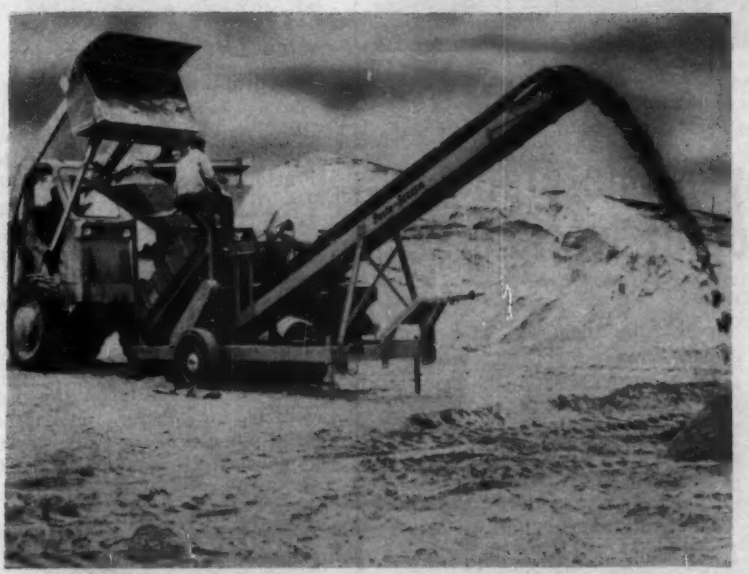
PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO, S. A.; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD



Straddle Trailer Loads and Unloads Itself

This trailer can pick up and deposit a load without any help from a loading crew. The load is stacked on pallets, the trailer is backed over it, and built-in hydraulic elevators raise the load to travel height.

Overall width is 8 ft; maximum load width is 69 in.; length is up to 45 ft. Normal road clearance is 12 in. with a maximum of 40 in. Walking beam construction in the rear eliminates the through axle. Capacities range from 25,000 to 100,000 lb.—**Straddle Trailer Co., 1701 E. Louisiana Ave., Denver, Colo.**



Sand Screening Plant Is Self-Contained Unit

Very little time is required to set up the Porto-Screen sand screening plant. It is a completely self-contained, trailer-mounted unit available in two models.

Capacity of the smaller unit is 30 to 50 tons per hour. A two-cylinder, air-cooled engine powers the plant. It weighs 4,500 lb. A salt hopper with a capacity of 140 lb is available for adding bagged salt for ice control.

The larger model weighs 7,500 lb and has a capacity of 65 to 85 tons per hour. A four cylinder engine powers this unit. **Eastern Engineering Sales Co., 25 W. Howard St., Quincy 69, Mass.**

Chevrolet Expands Line, Shows 165 Models for 1960

The 1960 line of Chevrolet trucks consists of 165 different models, but only four different engines are offered.

Two six-cylinder engines have displacements of 235 and 261 cu in. The V-8 plants have 283 and 348-cu-in. displacements. Sixes are available on low-cab-forward units, and V-8 power is standard or optional on all except forward control models.

Twelve transmissions are available. The hydraulic clutch control system and front and rear suspensions have been redesigned. —**Chevrolet Motor Div., General Motors Corp., Detroit 2, Mich.**

Muck and mire doesn't faze Austin-Western's powerful all-wheel drive hydraulic crane—shown here doubling in brass to tow heavy compressor-trailer on Niagara Power Project.

Austin-Western hydraulic crane . . . construction project workhorse

"We haven't got a single rig on the job that is more all-around useful and hardworking than the Austin-Western hydraulic crane." That's what Fred Sebastian, project manager for Gull and De Felice Construction Co., Niagara Falls, N.Y., says about the A-W crane.

"All-wheel steering gives it plenty of maneuverability to get in and out of the tightest places, yet it has enough speed to work fast in a large area. We work it double shifts and have never had any maintenance problems with it.

Handles, tows, totes and maintains

"It's a real workhorse on this job. We use it for everything . . . as a materials handling crane, to tow or tote, to maintain other equipment, and even as a back hoe.

"Our operators like it too. They seem to do a better job with equipment which they like and which doesn't tire them out. It's easy to operate with precision because of instant response from the hydraulic controls."

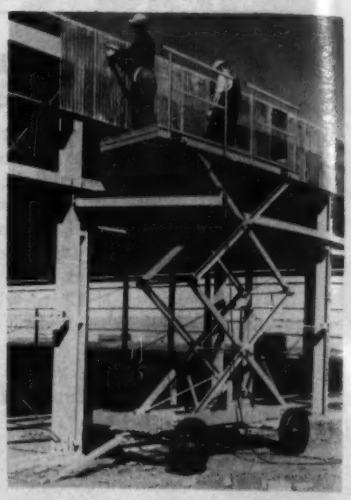
The Austin-Western hydraulic crane is a versatile all-purpose 5-ton crane with 18-ft. telescoping boom. Full circle swing permits loading from front, rear or sides.

All-wheel drive and steering

All-wheel drive delivers plenty of power and traction for top performance under all surfaces and weather conditions. All-wheel steering permits an extremely short turning radius . . . maximum maneuverability. It is designed and built by Austin-Western to do more work with minimum maintenance.

Learn today why A-W crane owners are so enthusiastic about this versatile construction workhorse. Contact your nearby Austin-Western distributor or write us direct.

Austin 1859 AUSTIN-WESTERN 1959 100th YEAR PARTNERS IN PROGRESS Western
CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.
BALDWIN · LIMA · HAMILTON
Power graders • Motor sweepers • Road rollers • Hydraulic cranes



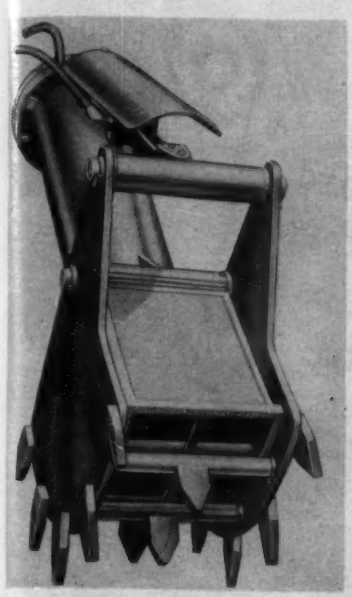
Hydraulic Scaffold Also Lifts Materials

A hydraulically elevating scaffold also works as a portable materials lift. The Sky Witch can lift loads weighing as much as one ton. Platform sizes range from 2½x 7½ ft to 5x24 ft. It can elevate to a height of 24 ft.

A single lever on the platform controls raising and lowering. Gasoline or electric motors power the hydraulic system on standard models. Air motors are optional. The Sky Witch is available on skids for mounting on the user's vehicle, on caster, on rubber-tired wheels, or on trailers.—**The Charles Machine Works Inc., 699 B St., Perry, Okla.**

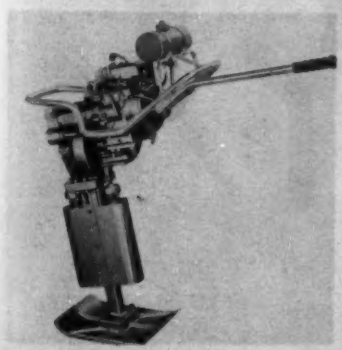
Extra Long Trailers

Hercules dump trailer bodies are now available on an extra long chassis. The 28-ft full frame, corrugated steel units are mounted on a 31-ft chassis and permit a maximum payload of 43,000 lb. Aluminum models are also available. — **Hercules Steel Products Co., Galion, Ohio.**



Dredging Agitator

The Van Gorp Aggregator, a medium weight dredging agitator, is available for 6, 8, 10, and 12-in. suction lines. The unit speeds up dredging operations by cutting through hard layers of material. The Aggregator's face and side plates push large rocks away from the suction nozzle. — **Van Gorp Mfg. Inc., Box 123, Pella, Iowa.**



Compactor

Racine Hydraulics now offers a new compactor, the Rapak. It is a self-contained unit with a 3-hp, 4-cycle gas engine. It has a one-shot lubrication system.

The compaction rate is adjustable from 400 to 600 blows per minute. Interchangeable shoes permit variation of working width from 6 to 18 in. Extensions are available for increased depth. **—Racine Hydraulics & Machinery, Inc., 2000 Albert St., Racine, Wis.**

Record snows in upper New York State — no problem for this powerful A-W Super 300 grader equipped with V-plow and wing.

How exclusive features of Austin-Western graders

SPEED SNOW REMOVAL

Only Austin-Western graders offer all-wheel drive and all-wheel steering. Years of experience prove these two exclusive features help make Austin-Westerns the fastest, most efficient and powerful snow removal equipment available anywhere!

No front-end dead weight

All-wheel drive gives front-end traction to deliver powerful push-pull driving action for deep plowing—no front-end dead weight on an A-W.

Encountering heavy drifts, ordinary graders stall out, get stuck or bounce off. But not A-W's! All-wheel steering enables operator to steer the rear towards drifts, controlling traction and direction of travel to offset sidethrust of full plow load when widening or winging.

Precision hydraulic controls reduce operator fatigue—permit fast, easy operation from warm, weathertight cab. Quality built for dependable high performance; low maintenance. This next winter, rely on A-W graders; keep roads and streets open! Superior, too, for year-round all-purpose construction and maintenance.

Available in 6-wheel Super and 4-wheel Pacer series—wide range of weight classes and horsepower ratings!

ALL-WHEEL DRIVE puts power up front.

ALL-WHEEL STEERING lets you steer both front and rear.

Get all the facts today from your nearest Austin-Western distributor—or write direct!

Austin 100th YEAR Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

When you need construction fasteners fast, call Bethlehem. We carry a wide variety of standard types and sizes in stock. And when you need special fasteners, you can count on us for fast handling.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

UNIT takes a big bite!

Swings and Dumps FAST

Operator can SEE what he's doing at all times!

• Here is one of many contractors who prefer the UNIT 513C Challenger for handling bulk material. The pictures show the machine removing and loading used carbide slack from the pit of a large chemical plant. Equipped with ½ yard clamshell bucket, the 513C takes a big bite, swings and dumps fast. Output averages about 30 yards per hour. Hydraulic clutches, and easy-to-reach levers, simplify the machine operation. And the safety-promoting FULL VISION CAB enables the operator to SEE what he is doing at all times. Get all the facts. Write for Bulletin.

UNIT CRANE & SHOVEL CORP.

6305 W. Burnham St., Milwaukee 19, Wis., U. S. A.

F/S OPTICAL
PLANIMETER
Model 236/A
Eyestrain and parallax in contouring the figure are eliminated by the optical tracer. No need for subtracting the initial reading or adjusting the counting wheel manually.
• Tracing lens providing large magnification
• Zero setting control
• Vernier unit adjustable from .006 to .020 square inches
• Full servicing by factory specialists
F/S offers a complete line of high
engineering instruments.
nearest dealer or write
detailed literature.
SALMOIRAGHI, INC.
254—5th Ave.,
N.Y.C. 1, N.Y.
DEALERS'
INQUIRIES
INVITED

F/S DISTRIBUTORS: The A. Lietz Co., San Francisco and Los Angeles, Calif.—National Blue Print Co., Chicago, Ill.—Watts Instruments, Columbus, Ohio—Geo. F. Muth Co., Inc., Wash., D. C.—CANADA: Instruments 1951 Ltd., Ottawa, Toronto, Regina, Montreal.

Hydroscale attached to hold back winch used on dynamometer application in pipeline laying.

HYDROSCALE®

for GIANT APPLICATIONS as a DYNAMOMETER

- Indicates direct loads up to 200,000 lbs.
- Engineered and built for long service-life.
- Over 110 Models in the complete line.
- Capacities 0-500 lbs. to 0-200,000 lbs.
- Easy-to-Read dials available in 3 sizes.

Hydroscales are ideal for use as Dynamometers in measuring Drawbar Pull, Cable and Powerline construction, Pipeline laying, Bridge construction and wherever contractors need to accurately measure tension or weight.

Hydroscales are used throughout the world for such applications as:—

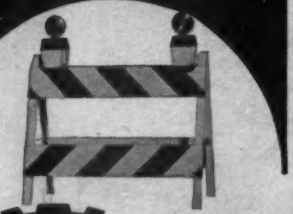
• Pipe Coating • Pipeline Laying • Measuring Suspension Bridge Strain • Equalizing Guy-Wire Tension • Cable Anchoring Devices • Traction Testing • Torque Testing • For Use As a Hanging Scale for Weighing, check weighing and Inventory Material Weighing • Protecting Equipment From Overloading.

HYDROSCALES Guaranteed—They are guaranteed to be free of defects in workmanship and materials, and to be accurate to ½ of 1% of the maximum dial capacity.

"The world's largest producer of crane scales"

HYDROWAY SCALES, INC.
31290 STEPHENSON HIGHWAY
ROYAL OAK, MICHIGAN

END that Costly Scrap Heap



with PM Barricade Kits
you can replace the damaged parts!

Yes, PM Barricade Kits give you the most flexible replacement system ever devised for barricades. You just replace the damaged part and your barricade is back in business! *An extra job profit of $5.00 per barricade per month for you!*

PM Transistor Neon or Incandescent Flasher Warning Lights put profit in your pocket, too! They're lighter, brighter, require less maintenance.

Write for free demonstration. There's a PM Field Engineer near you.

Pacific Mercury
13232 Leadwell
North Hollywood 3, Calif.

Manufacturers of the Thomas Electronic Organ

Transfer Pump Runs On Truck Battery

A self-priming, 20-gpm pump that runs on the power supplied by a truck battery is direct-coupled to a 6 or 12-volt dc motor. It can be mounted on a pickup truck.

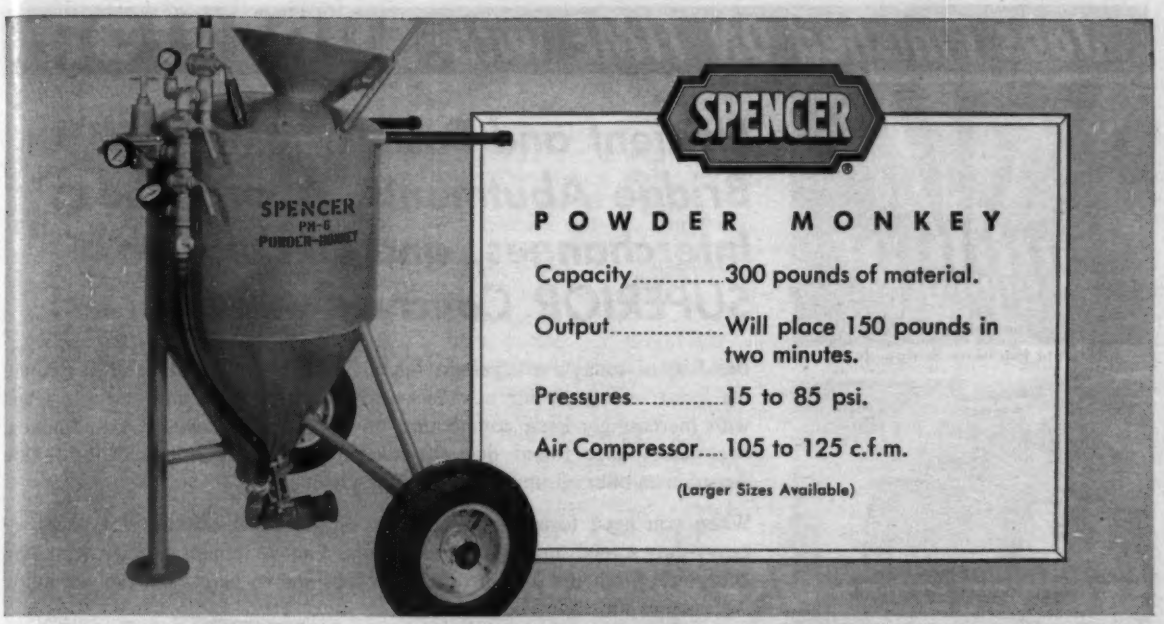
This synthetic rubber impeller pump can be used to fill, empty, or transfer clean or dirty liquids like water, gasoline, oil, or spray solutions. Available accessories include hoses, nozzles, and strainers. The unit is complete with a dc motor, switch, and starting solenoid.—**Jerome Simer Co., 422 Stinson Blvd., Minneapolis, Minn.**

Engine's Timing Gear Drives Air Compressor

A new lightweight, compact engine air compressor will become standard on Cummins diesels November 1, 1959. It is built by Cummins, is 5 to 20 lb lighter than previous units, and supplies air for air brakes. The engine timing gear train drives the compressor. Its crankshaft and bearings also serve as the shaft and bearings for the accessory drive. The compressor's speed is the same as that of the engine.

The compressor's simple design permits on-the-spot servicing without complete removal from the engine. All valves can be serviced without removing the cylinder head. The crankcase assembly can be reached without removing the compressor support and crankshaft.

Capacity of the one-cylinder compressor is 12 cfm. It is water cooled and lubricated from the engine. Weight is 47 to 50 lb depending on the type of engine. It is available for all Cummins H, NH, and six-cylinder J and C diesels. — **Cummins Engine Co., Inc., Columbus, Ind.**



One man is all it takes to fill horizontal holes with Spencer N-IV Ammonium Nitrate and fuel oil, when you use the new Spencer Powder Monkey. Available with wheels for towing, or mount on powder truck.

Now! A Fast, Easy Way To Fill Horizontal Holes With Ammonium Nitrate-Fuel Oil Mixtures:

New Spencer Powder Monkey saves you $3.00 to $4.00 per 100 pounds on bag costs alone!

Scientifically designed for placement of Spencer N-IV Ammonium Nitrate-fuel oil mixtures in horizontal blast holes, the Spencer Powder Monkey extrudes the mixture into the hole. Then the Powder Monkey is filled with sand, which is blown into the holes for stemming.

There's no need for tamping bags, tamping equipment, or the labor needed to fill and tamp bags into the hole!

With the Spencer Powder Monkey, you can actually load faster and more economically than with any other known method! Job-tested on holes ranging from 1⅝ inches to 8 inches in diameter, the Powder Monkey has proved itself under a wide variety of conditions.

Another advantage of placing Spencer N-IV and fuel oil with the Powder Monkey is that you can prime the entire charge with detonating cord at the same time you insert the hose in the blast hole for filling.

World's Most Efficient Low-Cost Blasting Method

Spencer N-IV Ammonium Nitrate, combined with fuel oil and fired with detonating cord, produces a superior blast for these two reasons: (1) Spencer N-IV has a special structure that lets the prills absorb oil more easily. (2) Spencer N-IV contains a higher percentage of ammonium nitrate than other brands.

Because of these two advantages, Spencer N-IV as an ingredient in blasting agents produces more energy than competitive grades of ammonium nitrate, yet costs no more!

With Spencer N-IV and fuel oil you save on priming costs, too, because this mixture can be initiated with a single strand of 175-grain detonating cord. And you put an end to the danger of storing high explosives on the job site because Spencer N-IV by itself is not an explosive!

Spencer N-IV is available in all-plastic 50-lb. bags that are tougher than paper—so tough they reduce breakage as much as 50%. And you can store them right out in the open. (Also available in paper bags.)

For complete information, mail the coupon below:

SPENCER

Spencer Chemical Company
409 Dwight Building
Kansas City 5, Missouri

Yes! I want to know more about:

☐ Spencer Powder Monkey
☐ Spencer N-IV Ammonium Nitrate as a blasting ingredient.

Name_____

Firm_____

Address_____

City_____ State_____

Jobs Finished ON TIME with SUPERIOR

Interstate Highway Bridge—Iowa

Efficient and Fast Forming of Bridge Abutments, Approaches, Interchanges, and Decks with SUPERIOR Concrete Accessories.

Building of today's overpasses, interchanges, and related projects require the latest in engineering advances and construction techniques. . . . And with increasingly keen competition on all types of concrete construction, contractors have found that the efficient forming methods of SUPERIOR Accessories offer all-important bidding advantages.

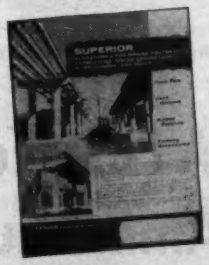
When you need form hangers for decks, threaded coil ties for walls, or heavy-duty screed supports for heavy screeding equipment, specify SUPERIOR and you'll finish the job on time! The jobs shown here used the SUPERIOR Accessories illustrated below.

Prescon Hangers in Position

Illinois Toll Highway Bridge

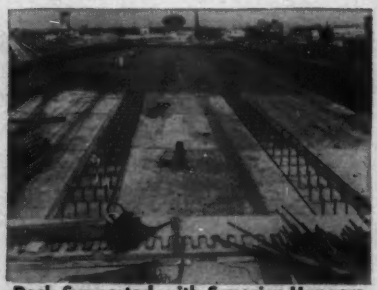
Our experienced engineering service is available to prepare form layouts, estimates and quotations. This comprehensive service is offered free.

Photo Credits: Marquette Cement Co.; California Division of Highways; Kenny Construction Co.; Illinois Toll Highway Commission



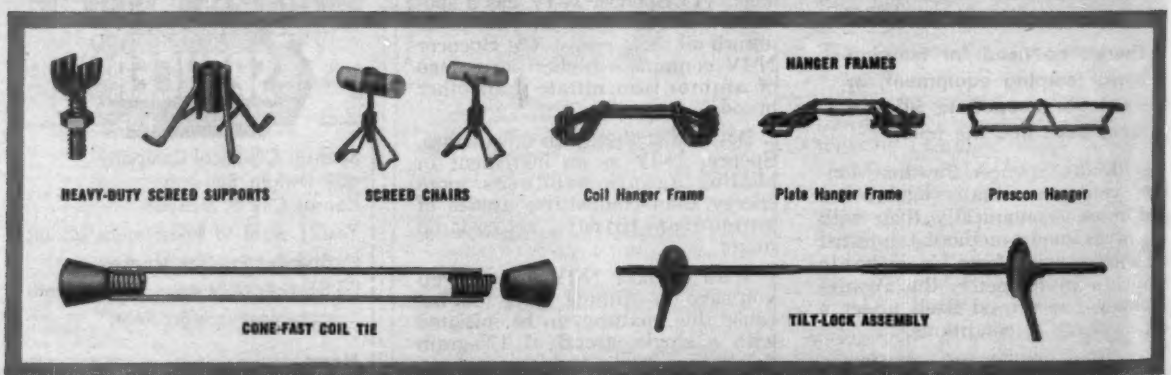
For Details request a copy of 6-page BULLETIN BB-458

Vallejo, Calif. Interchange



Deck Supported with Superior Hangers

Chicago-Calumet Skyway



SUPERIOR Concrete Accessories, Inc., 9301 King St., Franklin Park, Ill. (A Suburb of Chicago)

NEW YORK OFFICE 39-01 Main St., Flushing 54, N. Y.

HOUSTON OFFICE 4101 San Jacinto, Houston 4, Tex.

PACIFIC COAST PLANT 2100 Williams St., San Leandro, Calif.

New Transmission Shifts Gears Instantly

Power shift transmissions, available on Caterpillar D8 and D9 tractors, combine features of both direct drive and torque converter power trains. One lever shifts gears instantaneously without interruption of power.

Heart of the new power train arrangement is a planetary gear set driven by the engine flywheel. It transmits one-third of the engine torque directly to the transmission input shaft; the remainder is transmitted through the torque converter.

One range-selection lever replaces the flywheel clutch lever, gear selection lever, and forward-reverse lever. The machines can be shifted under full load.

Directing a portion of engine torque straight to the transmission input shaft retains the solid feel of direct drive tractors. It also improves the unit's efficiency. Engine power directed through the torque converter allows the tractor to adjust travel speed to load automatically, as on conventional torque converters.

This combination power train also gives the operator audible indication of engine lugging when close to stall conditions. The power shift transmission allows the operator to shift down instantly under an increasing load.

The three-speed forward, three-speed reverse planetary transmission consists of five inline gear trains, each with a separate clutch. Two of the planetary trains are directional; three constitute the low, intermediate, and high gear ranges.

A universal joint connects the transmission and torque converter. Either unit can be removed without disturbing the other machine components.

At the operator's left hand, the gear range selector lever travels in a horseshoe-shaped guide on a pedestal. One leg of the horseshoe contains three forward ranges; the other leg has the same ranges in reverse. Neutral is at the curve of the shoe.

A manual safety lever locks the gear selector in neutral. The control system also contains a hydraulic safety valve that automatically shifts the transmission into neutral when the engine is stopped.—**Caterpillar Tractor Co., Peoria, Ill.**

HEY! YOUR SLIP IS SHOWING!

And *your* slip is showing, too, when your crawler tracks start spinning.

But you can restore full pulling power to your worn grousers in less than 30 minutes in the field with MARQUETTE's Tractor Strip "retread."

And you can save 30% or more – up to $400 – of the cost of a new set of grousers by using easy-to-weld Tractor Strip. Often, it lasts longer than original grouser bars! Sizes available to fit *all* tracks.

Write MARQUETTE today for the name of your nearest dealer who handles Tractor Strip and the full line of MARQUETTE welders, welding accessories and battery charger-tester equipment.

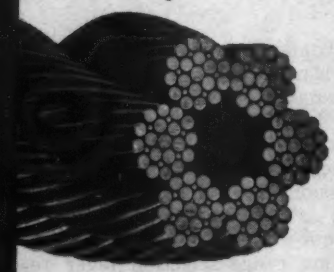
MARQUETTE

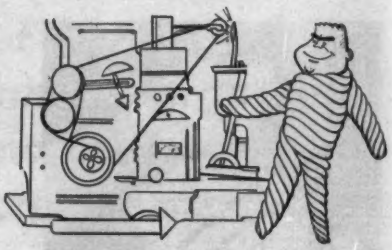
MARQUETTE MANUFACTURING COMPANY, INC.
307 Hennepin Avenue • Dept. B-1010 • Minneapolis 14, Minn.

Tuffy® Wire Rope Tips

To Get The Most for What You Pay Be Sure You Get Correct Rope Lay

Wire Rope is a "Machine" of Moving Parts





...and Every Part Must Fight Destructive Forces

A "look inside" a piece of wire rope reveals a precision-designed assembly of working parts. The parts are core, wire and strand. They are subjected not only to external and internal stresses and strains, but also to heavy surface pressures and abrasions. All these forces may be sustained while the rope is running under very high speeds, and abruptly changing direction of motion. That's why different uses require different constructions of wire rope.

Tuffy Balanced Dragline Rope

Here's highest abrasive resistance with super flexibility. Better spooling. Smoother riding on grooves. And Tuffy Dragline Rope hugs the drum when casting for full load. Gives you longer service life, consistent dependability, in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

Extra Strength Alone is Not Enough... Wire Rope Must Be BALANCED

Sometimes extra strength is heavily stressed in advertising wire rope. While strength is important wherever wire rope is used, it is not the only important property. And there are cases where too much strength is a liability.

For example, manufacturers of scrapers have designed their equipment to take certain loads. These loads are controlled by, or subject to the ultimate strength of the rope. Larger ropes with higher strength do not break, but *the equipment itself begins to break up.*

Depending on your use of wire rope, the "job prescribed" Tuffy Special Purpose Ropes give you the RIGHT BALANCE of strength, toughness, flexibility for greatest efficiency and longest service life.

Tuffy Balanced Slings & Hoist Lines

"Balanced" because they combine strength, flexibility and toughness in the proper relationship to do a better job longer.

Tuffy Slings and Hoist Lines are a top-performing team in every type of materials handling. The slings are made of a patented, machine-braided fabric that's next to impossible to knot or kink. The hoist lines are a special construction in which strength, flexibility and toughness are balanced.

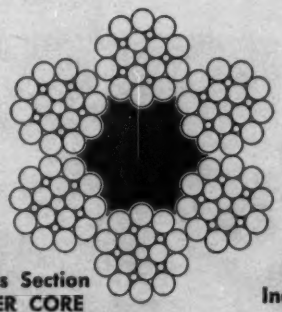
Tuffy Balanced Dozer Rope

Built to give you longer service with less downtime. Mounted on your dozer, a 150' reel of ½" or 9/16" can give you a big bonus of extra service. Here's how: when rope shows drum wear or is crushed on the drum, you feed through just enough to replace the damaged part. You save the 40 to 50 feet ordinarily thrown away. Also available in 300' and 500' reels.

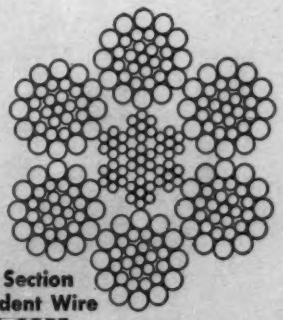
Tuffy Balanced Scraper Rope

"Balanced" construction makes it flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Also gives higher resistance to the shock of load impact on slack line. Moves more yardage per foot because it's specially built to take the beating of drum-crushing abuse.

Let's Take A Look at the CORE of Wire Rope



Cross Section
FIBER CORE

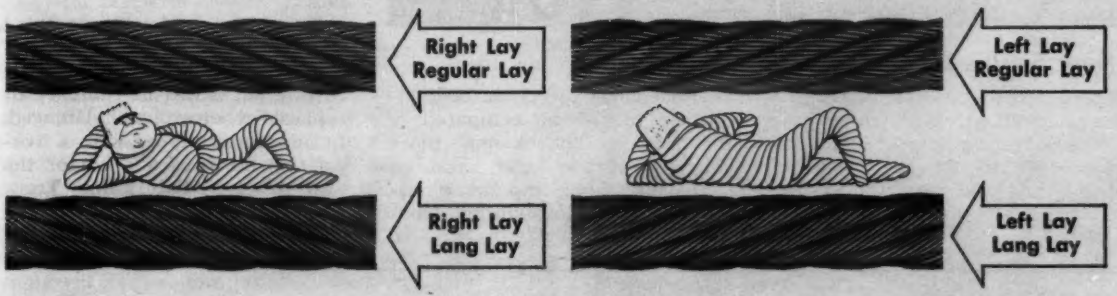


Cross Section
Independent Wire
ROPE CORE

It's either fiber or steel. Fiber cores are usually made from sisal, java, manila or combination of such hard fibers. Steel cores are either wire strand or an independent wire rope core, which amounts to a separate wire rope. The core serves as a base for the strands, keeping the rope in round shape and providing clearance between the strands for freedom of movement.

It's easy to see why wire rope is a "machine"—deserving the same care in selection and use that is given to any fine machine.

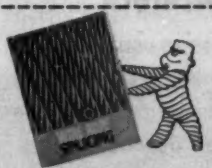
Which Lay of Wire Rope is Right for What Use



The "lay" of a rope is described in directional terms. It's a right lay when the strands pass from left to right across the rope. It's left lay when they pass from right to left.

Wire rope is also either regular or lang lay. In the regular lay the wires are laid in strands opposite in direction to the lay of the strands. In the lang lay rope, the wires are laid in the strands in the same direction as the lay of the strands.

Most wire rope is regular lay. It has the greatest stability under the widest range of uses. On the other hand, lang lay is used in applications where greater flexibility and longer wearing services are needed.



FREE!

Complete Splicing and Socketing Manual with engineer's notebook on wire rope constructions and specifications. Write for your copy now. Address Union Wire Rope Corporation, 2270 Manchester Ave., Kansas City 26, Missouri.

Specialists in high carbon wire, wire rope, braided wire fabric, stress-relieved wire and strand.

Good Man to Know: Your Nearby Union Wire Rope Distributor

Whether your wire rope need is a scheduled replacement or a red-hot emergency, your Union Wire Rope distributor is ready. He keeps varied stocks of Union standard constructions and the Tuffy Special Purpose Ropes. And he's backed by quick service from his nearby Union Wire Rope depot.

If it isn't rope you need, but advice on a wire rope problem, he's just as ready to help. If you don't know your Union Wire Rope distributor already, look under "Wire Ropes" or "Slings" in your telephone directory yellow pages.

Your Tuffy Distributor Can Help You Get Longest Service Life and Cut Rope Costs

UNION Wire Rope

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company
Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Southwest Steel Products

New steels are born at Armco

4

New Series D9 Cat

The Caterpillar D9 series E tractor is available with three different transmissions including direct drive, torque converter drive, and the new Caterpillar power shift (see page 175).

Horsepower rating has been increased to 335 hp compared to the previous 320. A new, more compact turbocharger has an open compressor impeller eliminating the previous shroud. One-piece turbine and shaft construction replaces studs and bolts on the turbocharger.

The track group is completely new. It features increased track link pitch and height, larger track pin and bushing diameters, higher grousers, and bigger track bolts. Lifetime lubricated track rollers, track carrier rollers, and front idler bearings are also included in the series E models.

Hydraulically controlled bulldozers are offered for the first time on the D9. The hydraulic system allows the tractor's weight to be used for exerting down-pressure on the blade. A hydraulic control unit is available for tilt cylinder use only when the tractor is equipped with a cable dozer.

Three models of cable-operated bulldozers have also been improved. The three-piece blade cutting edges can be reversed or replaced when worn or damaged. In addition, a ripper with a five-position clevis is offered for the new tractor—**Caterpillar Tractor Co., Peoria, Ill.**

STANG LOWERS THE WATER TABLE 20 FT. IN −15° WEATHER

Sub-zero weather, yet business as usual—thanks to the reliability of a Stang Wellpoint System. In any weather, under all conditions, you can depend on Stang engineered dewatering systems. Call on the John W. Stang Corporation next time you have a dewatering problem. They're first in engineering, first in equipment, and first in service.

PROJECT: STORM DRAINS FOR MINNESOTA STATE HIGHWAY DEPT., BLOOMINGTON, MINNESOTA. CONTRACTOR: BARBAROSSA & SONS, INC., ST. CLOUD, MINN.

JOHN W. **STANG** CORPORATION
8221 ATLANTIC AVENUE, BELL, CALIFORNIA
Engineers and Manufacturers of Dewatering Equipment, Wellpoint and Pumping Systems, Dewatering Planning—Equipment—Service

OMAHA, NEBRASKA
TULSA, OKLAHOMA
MOBILE, ALABAMA
TACOMA, WASHINGTON
SO. MINNEAPOLIS 17, MINN.
ST. PETERSBURG, FLORIDA

NEW-

Tow it into place

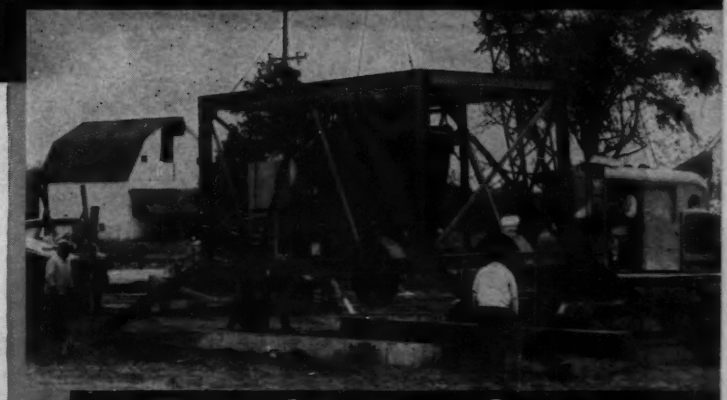
...Weir Contracting Co. tows their Heltzel Unitized/Mobilized Batching plant from previous job site on its own transportation wheels...

Heltzel's new 100 and 150-ton, pushbutton batching plants are now *unitized* and *mobilized* for easier moving—for faster setup—for greater savings of time and money.

The new plant consists of two self-contained mobile sections; hopper section and batcher section (including scales) with new fold-up supporting columns. Both sections have built-in wheel assemblies and towing tongues—ready to roll.

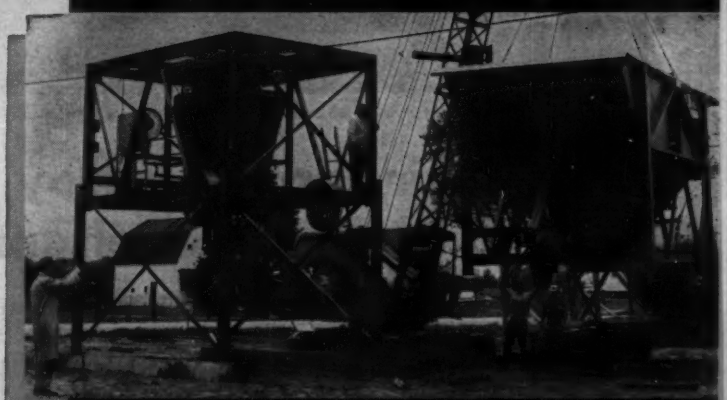
Weir Contracting Company of Detroit, Michigan reports: "... Our first job was in Greenbrier Meadows Subdivision, Livonia, Michigan. After the plant arrived on the site it was ready for operation in a very few hours. We found that the speed of batching will give two complete batches in thirteen seconds. On subsequent work, the plant was dismantled and ready for transportation in two hours and towed by small, single axle dump trucks to the new location. We have found that the built-in transportation wheels save us over $100.00 a move because of not having to rent trailers."

For complete data and specifications contact your nearby Heltzel representative—or write us direct.



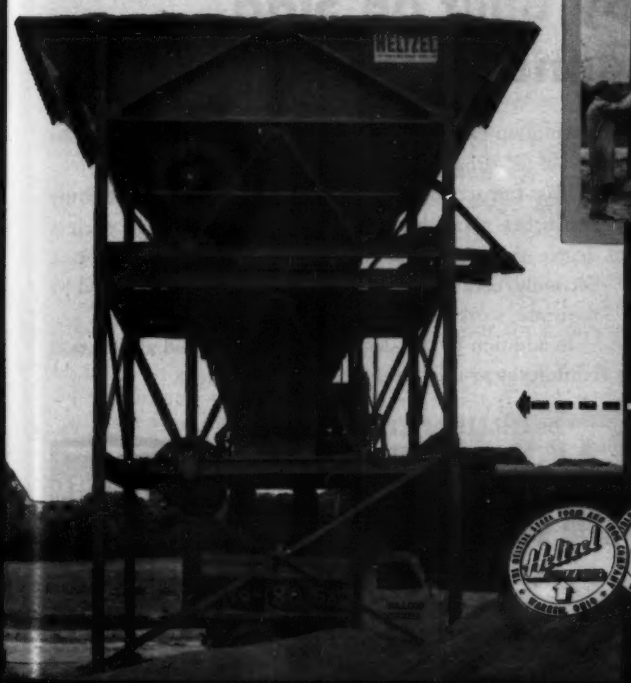
Set it up fast

... batcher section is raised into position, hinged columns are lowered and bolted in place ...



... bin section is positioned and bolted on top of batcher section.

Start batching



In just a few hours this full size, high capacity, pushbutton paving plant is ready to operate!

THE HELTZEL STEEL FORM AND IRON COMPANY
WARREN, OHIO

Two-mile-long airport runway in the Susquehanna River rests on a foundation of Bethlehem blast-furnace slag. Contractor: C. J. Langenfelder

Air Force Runway Built on Slag in Susquehanna River

Olmsted Air Force Base, Middletown, Pa., was unable to accommodate jet aircraft on its existing runways. Nor was there room for expansion—except in the Susquehanna River. The river proved to be the best location for a two-mile-long runway.

The twin problems of constructing a solid runway foundation, and a levee to protect the runway from high river water, were solved by using blast-furnace slag from an adjoining Bethlehem steel plant. The levee and runway foundation took 4 million cu yds of slag—one of the largest single uses of blast-furnace slag on record.

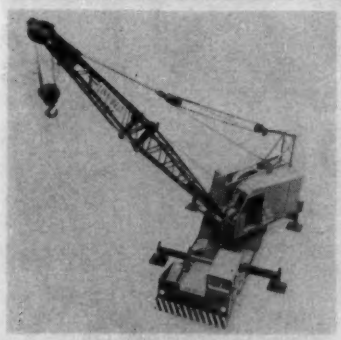
Construction of the runway base required an additional 1½ million cu yd. The amount of slag used for both jobs would fill a train of hopper cars 467 miles long.

Blast-furnace slag had two distinct advantages: when only six inches above water level, it consolidated to such a degree that 60-ton hauling units could operate over it. Secondly, because compaction of slag is little influenced by moisture, work could continue even after heavy rains.

In addition to the slag, Bethlehem supplied all the steel reinforcement used in the concrete pavement.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



Travels on Highways Without Special Permit

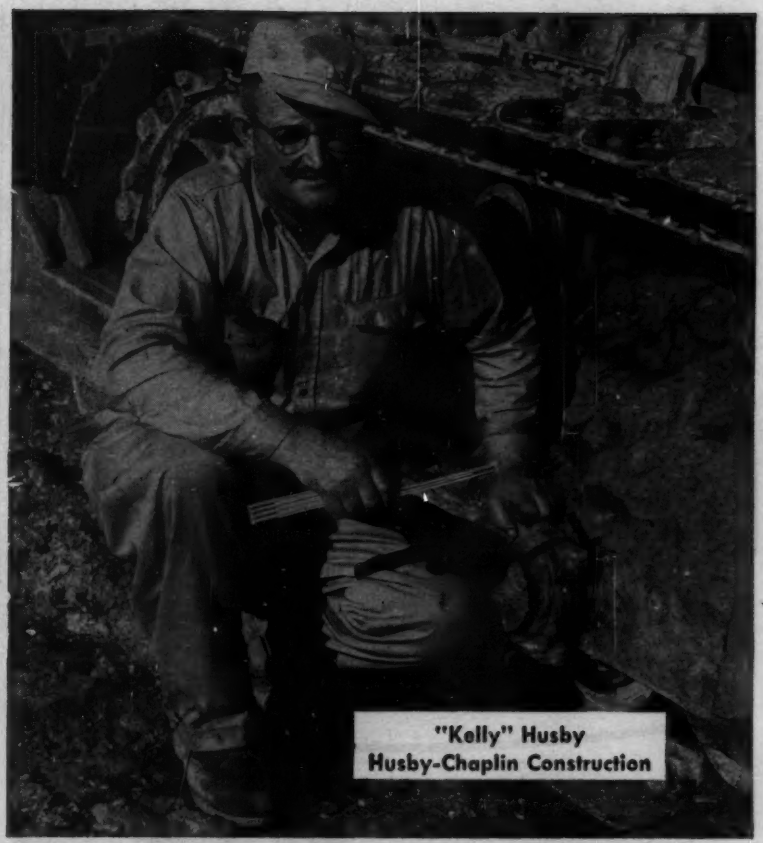
The Link-Belt HC-78A Zephyr-crane can travel on most highways without a special permit. It is not necessary to remove major components, but the counterweight and outriggers are removable for travel in areas where legal load limits are low. The complete machine weighs approximately 60,000 lb. Overall width is 8 ft.

The crane has screw type outrigger jacks and hydraulic power steering. Separate sets of shafts, gears, and clutches permit individual power flows for all machine operations. Standard equipment includes an independent boom hoist with boom lowering clutch, retractable high gantry, hydraulically controlled swing brake, spring loaded boom backstops, and a foot throttle. A safety boom limiting device and jibs up to 40 ft long are optional. — **Link-Belt Speeder Corp., 1201 Sixth St., Cedar Rapids, Iowa.**

Mass Concrete Vibrator

This one-man mass concrete vibrator is designed to compact the harsh mixes used in dams, large bridge piers, and similar jobs. Vibro-Plus model AO 32 consolidates concrete with aggregate sizes up to 12 in.

The vibrator weighs 70 lb. Head diameter is 6 in. It consumes 80 cu ft of air per minute and vibrates at frequencies of 7,000 to 8,000 vpm. The motor-in-head unit contains only two moving parts.—**Vibro-Plus Products, Inc., Stanhope, N. J.**



"Cut track overhaul costs? Sure! We're having our tracks done on a new OTC 'Trackmaster' track press which doesn't broach the pin bosses!"

"We expect about twice as much life out of each set of rails," says Clarence E. "Kelly" Husby, partner in the Husby-Chaplin construction firm in southern Minnesota, "because the OTC 'Trackmaster' hydraulic track press does not ruin the pin bosses, and we can keep rebuilding the rails. And this saves us money! As far as 'downtime' is concerned, there is another saving . . . because we get our tracks done faster, and keep our machines working."

SAVES MONEY IN OVERHAUL

Like contractor "Kelly" Husby, you can save money by having your tracks re-pinned on the new, fast OTC Trackmaster press. Ask your track repair man.

Write for additional information on OTC's new "Trackmaster" hydraulic track press:

RESEARCH · ENGINEERING · DEVELOPMENT

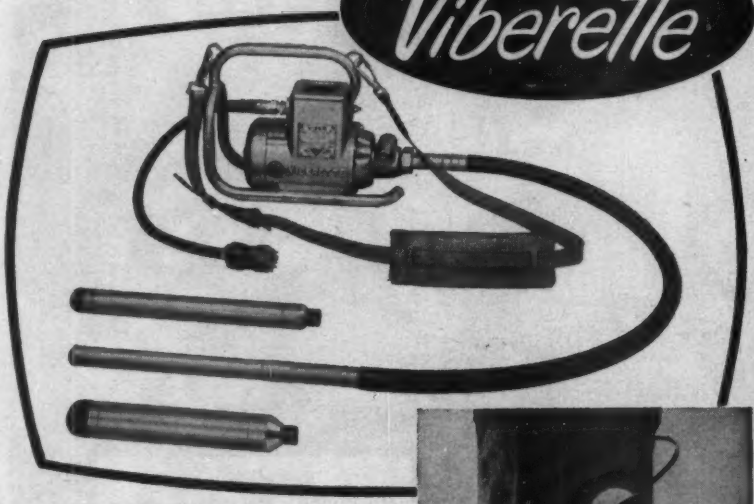
OTC

OWATONNA TOOL COMPANY

380 CEDAR STREET OWATONNA, MINNESOTA

Hard to reach places are easy for...

the powerful Viberette



in prestress work in narrow forms

Hard-to-reach places and narrow stems of prestress T-sections are no longer a problem when the new Viberette Vibrator is on the job. It is designed especially for prestress and narrow form building construction.

The *12,000 rpm speed* and low amplitude of Viberette produces extremely effective vibration in consolidating low slump concrete.

A *small diameter* flexible drive with replaceable rubber tipped head makes it ideal for concrete compaction in constricted areas.

A *powerful*, universal ¾ HP electric motor gives Viberette plenty of "kick" for thorough vibration.

The 19 lb. Viberette Vibrator with new, dual grip, skid type handle makes the entire unit easy for one man to operate. A new shoulder strap attachment leaves both hands of operator free to manipulate the flexible drive.

Features

Interchangeable heads—1", 1-5/16" and 1-3/4" dia.

Flexible drive lengths—1' to 20'

Quick release drive connection

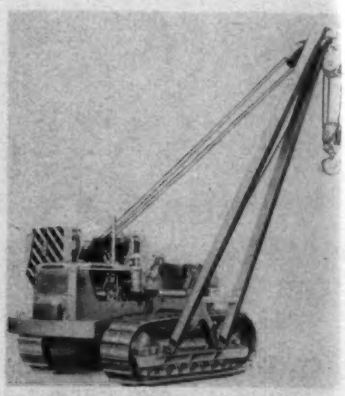
Replaceable rubber or steel tips

Contact your dealer or write direct for detailed information.
Viber Company, 726 South Flower Street
Burbank 28, California

VIBER CO

VIBRATORS

Pioneers and leaders in the manufacture of vibrators.



Pipelayer Has More Power

Addition of a turbocharger on the Cat No. 572 Series D Pipelayer increases its flywheel horsepower from 128 to 140. Winch speeds are higher, too, ranging from 106 fpm in first to 513 fpm in third gear. Lowering speed is 230 fpm.

Rollers and idlers are lubricated during assembly and need no further attention until rebuilding. Bearings are pressure-lubricated and gears are oil-sprayed. A dry air cleaner replaces the previous oil bath cleaner — **Caterpillar Tractor Co., Peoria, Ill.**

Suction Strainer

A floating suction strainer has been developed for use with pumps that draw water from streams or sumps or are used for dewatering excavations.

The Dolphin strainer is designed to draw water from just below the surface to avoid drawing in sand and impurities from the bottom and floating matter from the surface.

The strainer is constructed from stainless steel and plastics. It is available in sizes for 1½ to 4 in. hose.—**Megator Pumps & Compressors Inc., 930 Manchester Ave., Pittsburgh 12, Pa.**

YOU ASKED FOR IT!

WEIGHT
Only 8,500 lbs.
With 35 foot deck.

So! ...here's the ROGERS T1 HIGH-FLAT

Persistently for years, from various sources, have come requests for Rogers Brothers to build high-flat trailers.

Finally they have yielded and produced a trailer that meets every need and is worthy of carrying the Rogers name.

In keeping with Rogers consistent policy, these trailers have been so designed to give maximum performance and so constructed to assure long service with minimum maintenance.

Factors include: proper proportioning and balance, resilient springing, dependable braking and the use of a newly developed framing steel.

The spring mounted bogie has been proved in thousands of miles of gruelling service.

The liberal sized, reliable brakes are of time-tested Rogers design.

Of special interest is the T1 frame steel — a new product combining the strength of high quality steel with uncommon lightness.

No longer need truckers haul excessive dead weight to obtain required strength in their high-flat trailers.

Get complete information from your Rogers distributor or contact the factory directly. Use the coupon.

FILL IN — CLIP OUT AND MAIL

ROGERS BROS CORP.
Albion, Penna. Date_____

Send literature and complete information regarding HIGH-FLATS.

Name_____

Company_____

Street Address_____

City_____

ROGERS BROTHERS CORP.
ALBION, PENNSYLVANIA

Experience Builds 'em — ROGERS — Performance Sells 'em

EXPORT OFFICE: 50 CHURCH STREET
NEW YORK 7, N. Y., U. S. A. Cable Address: BROSITES

USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

Cost-Cutting Way to Clear Land

For builders and contractors, clearing land for construction is a necessary expense. But the faster you do it and the less manpower you have to put on the job, the more money you save. The best cost-cutting way is the Homelite way . . . with a Homelite One-man Chain Saw. Homelite Chain Saws have the power and practical attachments you need for lower-cost clearing. You can operate them safely . . . they're professional saws that even a novice can operate. You can fell 20" trees in as little as 18 seconds. You can buck, limb or trim trees easily in any position . . . right, left, up, down or upside down. What's more, Homelite offers a full line of attachments for every clearing job. Brush cutter makes quick work of removing brush and dense undergrowth . . . three times faster than hand tools. Clearing bar cleans out small trees and saplings quickly and easily. Send for our "full line" Bulletin L-1916 now, then ask for a demonstration.

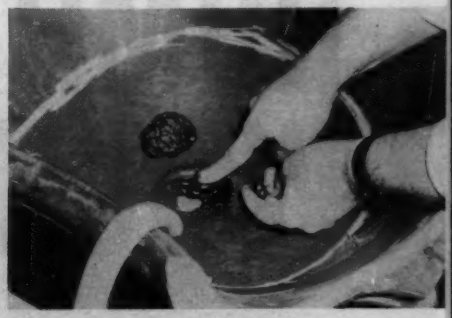
Homelite chain saw dealers and Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call or write for convincing demonstration or fast service in any way.

HOMELITE
ONE MAN CHAIN SAWS
PUMPS • GENERATORS • CHAIN SAWS • BLOWERS

HOMELITE • A DIVISION OF TEXTRON INC., 1010 RIVERDALE AVE., PORT CHESTER, N. Y.
In Canada—Terry Machinery Co., Ltd.

SKIVE RUBBER AROUND INJURY...

APPLY CEMENT TO BUFFED AREA...



BUILD PLUG IN THIN LAYERS...

Chemistry Helps Fix Tires Without Heat or Pressure

ONE WAY to put damaged tires back into service is to repair them by chemical vulcanization.

Any vulcanization is a chemical reaction involving rubber, sulfur, accelerators, and zinc salts. Heat vulcanization is an old and familiar process. Heat, time, and pressure are required to accomplish it.

Chemical vulcanization involves the same ingredients, but no heat or pressure is necessary. The difference lies in the selection of accelerators, activators, and sulfur. The result is a cured rubber compound with good physical characteristics. Here's what each of the ingredients does:

- Rubber acts as the base material.
- Sulfur cures the rubber.
- Accelerators shorten the curing time.
- Zinc oxide activates the accelerators.
- Carbon blacks work as reinforcing agents.
- Anti-oxidants preserve the rubber in service.

The right combination of these materials will vulcanize rubber without heat. The process is relatively simple. A man engaged in repairing tires can master the technique with a moderate amount of training.

Chemical vulcanization was developed by the Patch Rubber Co. of Akron, Ohio. The method is good for all types of repairs on all sizes of tires.

The repair gum is a natural rubber material consisting of two doughy compounds: Rubber-Fix, black, contains sulfur; and Rubber-Fix, tan, contains the accelerators. As long as the two compounds are kept separate, they remain putty-like. But a reaction starts when they are mixed. Chemical vulcanization requires 24 to 72 hr at room temperature for completion.

Forms or molds are not necessary for this process. The shape and roundness of the tire are not changed because it is cured in a completely relaxed position. Curing the tire in its natural shape also eliminates the possibility of developing distortion often caused by molds.

For chemical vulcanization the tire injury is prepared in the conventional manner. Then the curing compounds and patches are applied. Chemistry does the rest.

Here is the step-by-step procedure for repairing a tire by chemical vulcanization:

Step 1—Inspection. Look over the tire carefully. Often tires that fail in service should not have been repaired in the first place.

Step 2—Skiving. Cut off excess rubber around the injury to achieve a surface that will give maximum adhesion for chemical repair. Skive the outside to the breaker plies on a 45-deg angle; inside should be skived at 45 deg to meet the outside skive, keeping the hole as small as possible.

APPLY VULCANIZER FOR PATCH...

PLACE PATCH ON INSIDE PLUG

Step 3—Cleaning. To determine what area to clean on the inside of the tire, measure the longest dimension from edge of skive to edge of skive. Then select a patch of proper size and center it over the hole. Next, mark on the tire an area 1 in. larger than the patch. This is the area to be cleaned for buffing.

ALUMINUM DUMP BODIES WEIGH 50% LESS...

Haul Up to 3,500 Lb of Extra Payload for Added Profit

Durable Alcoa Alloys Defy Denting to Save Maintenance Dollars

Dent Resistant

Modern Alcoa Aluminum alloys, advanced design and new fabricating techniques combine to give today's aluminum dump bodies far greater dent and impact resistance than standard steel construction. They withstand years of hard knocks and grueling service. Service records prove aluminum assures longer unit life with less maintenance.

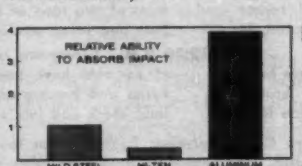
Light Weight

When you trim a pound of dead weight from a rig, you take on an extra pound of payload worth a dollar per year in extra revenue. Producing earnings as much as 16 per cent above average, lightweight dump bodies of Alcoa® Aluminum can pay for themselves in less than a year of operation. From then on, it's *all extra profit* for the operator.

Corrosion Resistant

Aluminum's corrosion resistance helps hold down repair costs to boost earnings even further. Needing no protective coating of paint, aluminum alloys stand up under the corrosive and abrasive attack of many commonly hauled bulk materials. Chemicals, salt, high-sulfur coal, fertilizers, lime and sand can't inflict damage, so aluminum dump bodies stay new-looking far longer than steel, wash clean in half the time—and dump clean every time.

A case history booklet, which tells how many operators have increased profits by switching to aluminum, is yours for the asking. Write to Aluminum Company of America, 1774-K Alcoa Bldg., Pittsburgh 19, Pa.



PROOF: Aluminum Is Tougher Tougher than steel! Dump bodies built of Alcoa Aluminum alloy can take *three* times as much impact as steel, at *half* the weight.

Your Guide to the Best in Aluminum Value

ALCOA ALUMINUM

For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and the Emmy Award winning "Alcoa Theatre" alternate Mondays, NBC-TV

On the tire outside, just clean the skived area.

Cleaning is one of the most important parts of chemical repair, especially on tubeless tires. Tubeless tire liners are covered with various lubricants; they cannot be buffed the same way as tube-type tires. The inner lubricant must be removed before buffing. This will keep the brush from working the lubricant into the buffed area and impairing adhesion. The Patch repair kit contains CHEM Sili-Clean, a cleaning solution specifically designed to remove silicones and lubricants. First, remove excess lubricants with a scraper. Then apply Sili-Clean with clean rags.

Step 4—Buffing. Buff the inside and outside skives smoothly. Deep grooves and burned or glazed cords hinder adhesion.

Step 5—Cementing. Apply a thin coat of black Rubber-Fix cement to the inside skive and exposed cords. Allow it to dry and apply a second coat. This cement is always used with Rubber-Fix chemical repair putty.

Step 6—Mixing the Putty. Mix the tan and black putties on a 50-50 basis. Small quantities can be mixed by hand. Larger amounts can be mixed in an ordinary household food grinder. Mixing is completed when no traces or streaks of tan putty are visible. The mixture can be used immediately, but it will give better results if allowed to stand for about 2 hr.

Step 7—Inside Plug. Spread a small amount of the mixed putty in a thin layer on the inside skived area and roll it with a stitcher. Build up the plug layer by layer until it completely fills the hole and is just higher than the band ply or liner.

Step 8—Cementing for Patch. Apply one thin coat of CHEM Liquid Vulcanizer with a stiff brush over the entire buffed surface and plug. Allow this to dry, and repeat the step. Then remove all bead blocks to return the tire to its natural shape.

Step 9 — Patch Application. Make three light cuts through the backing of the patch and peel off the two center sections. The patch can be handled by the unpeeled edges without contamination. It is held in a curved U position. Its center must contact the center of the plug without trapping air. After removing the remaining backing, stitch the patch from center to the edges.

Step 10—Outside Plug. Build it up in exactly the same manner as the inside plug until it is ¼ in. higher than the tread surface.

Step 11—Curing. This repair will vulcanize without heat in approximately 72 hr at room temperatures. Higher temperatures reduce curing time, but curing stops at low temperatures.

Step 12—Finishing. Trim off excess rubber and buff the plug. Then regroove it to complete the repair. The vulcanized portion will withstand the heat of retreading the tire.

Chemical vulcanization is simple, and the repairs are permanent. However, great care must be taken to follow the correct procedure in all details in order to avoid failure of the repaired tire.

Talk About Speed!

Only 12 man-hours to strip, move, set up and pour

Vix Construction Company, residential development, Englewood, Colorado

With just two men working, Warren Garrett, Denver concrete forming contractor, forms and pours a 37'8" x 23'0" residential basement foundation in twelve man-hours per working day...and not just once but consistently throughout many similar foundations!

Using Gates Horizontal Rod Forming System with 2' x 8' panels, Garrett places four rows of form ties in the wall and, to gain extra speed and economy, uses Gates re-usable Channel Top Ties at the top of the forms.

Here's a typical working schedule used by his crew in handling 121 lineal feet of forming:

6:30 A.M. Start cutting ties preparatory to stripping forms from previously poured foundation.

7:55 A.M. Forms and equipment have been moved and corner panels are set and braced in place on the footing.

9:00 A.M. Outside forms have been completely erected and braced plumb and true. The inside form will "float" to eliminate unnecessary walering and stiffening.

11:10 A.M. All forming has now been completed, including placement of two rows of reinforcing bars and seven windows.

12:30 P.M. Twenty-two cubic yards of concrete have been placed. Forms and bracing are given a final check and job is complete.

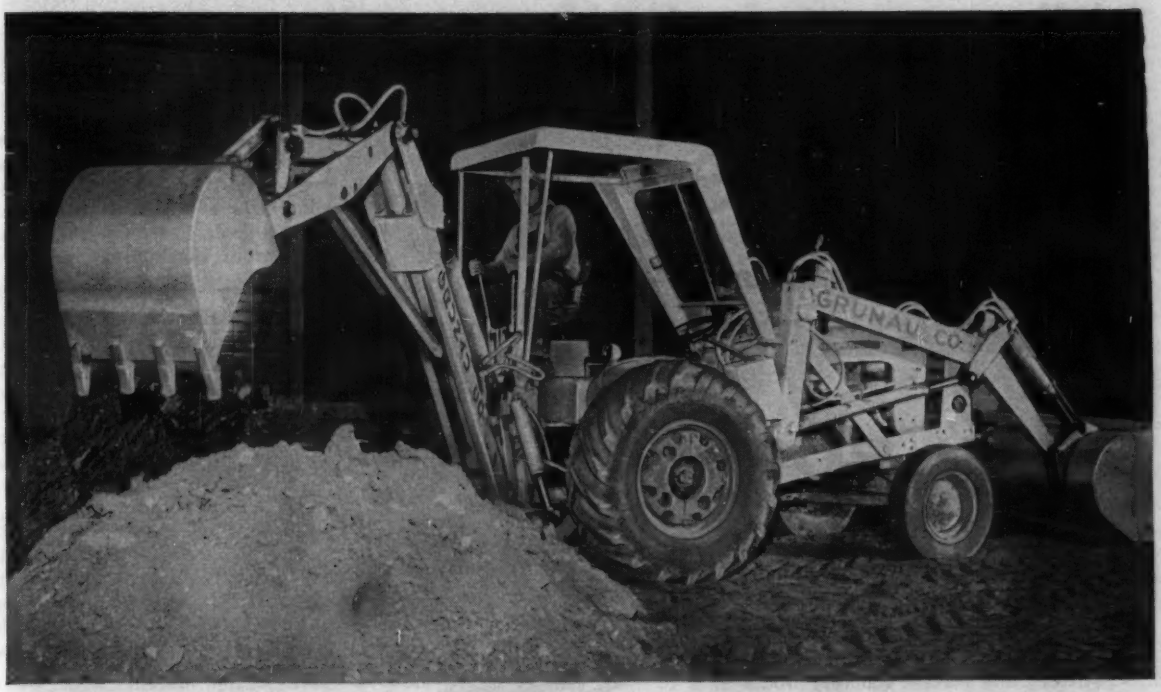
Investigate the many ways Gates Forming Systems can lower your costs and keep quality high. Additional information plus technical assistance is available from your nearby Gates Dealer, or write direct.

SEE OUR CATALOG IN SWEET'S LIGHT CONSTRUCTION FILE

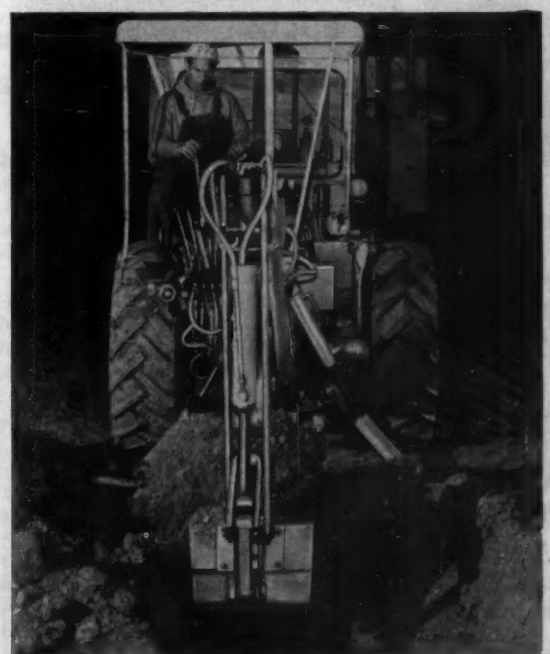
Gates & Sons, Inc.

80 S. Galapago Street Denver 23, Colorado

BRANCHES IN SPOKANE, ROCHESTER AND CALGARY CM&E—10/59



Moline power, ruggedness, speed service line trenching



Moline direct-drive pump boosts backhoe capacity – The Moline 445 Wheeler powers this backhoe through a rear-mounted hydraulic pump, direct-driven from the crankshaft. Direct-drive steps up efficiency, eliminates unnecessary drive gearing, improves fuel economy. Side-mounted pumps are also available.

Milwaukee contractor cites fast response, low maintenance on Moline 445 Industrial Wheeler

"We've operated our Minneapolis-Moline 445 Wheeler on trenching jobs for the past 12 months," says Paul J. Grunau of the Grunau Company, Milwaukee, Wisconsin. "We like the fast power response and all-around ruggedness of our Wheeler. Down time and maintenance cost has been *practically nil.*"

Grunau's Wheeler is equipped with a Moline backhoe and ¾ yard loader. Trenching operations have taken the unit over soft and rough grade, inside and out of buildings, excavating and backfilling for sewer and water lines, as well as loading and boom work.

Moline Industrial Wheelers offer many profit-making advantages on rugged, year-round construction service. Husky, Moline-built high-turbulence diesel or gasoline engines, optional shuttle reverse or Ampli-Torc 12-speed drive, direct-drive hydraulic pumps—and built-in hydraulic steering speed work cycles . . . cut job costs.

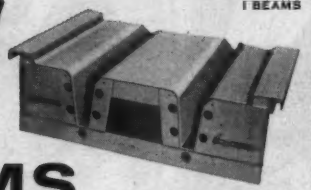
Heavy-duty Moline Industrial Wheelers are available in 4 sizes, with diesel or gasoline engines, complete with Moline loader-backhoe attachments.

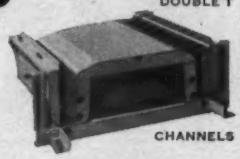
Check with your Minneapolis-Moline Dealer for facts on the newest in work-tested construction equipment.

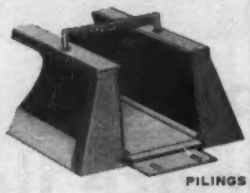
MINNEAPOLIS MOLINE

Why your dollar buys more with FORM-CRETE STEEL FORMS

I BEAMS


DOUBLE T


CHANNELS


PILINGS

BRIDGE BEAMS

YOU GET—EVERY FORM YOU NEED FROM ONE DEPENDABLE SOURCE

The Form-Crete line basic forms represents the most versatile group of steel forms ever produced for casting prestressed and precast concrete products. Each form has been carefully designed to insure a uniform, smooth product with every pour. Heavy-gauge steel construction means longer form life. What's more, many Form-Crete forms can be quickly adapted to produce a variety of finished products. And where special needs call for custom forms, FMC has the know-how and facilities to turn them out quickly and efficiently.

YOU GET—FAST, ON-TIME DELIVERY

Two modern plants, Lakeland, Florida in the east and Riverside, California in the west, have full facilities to turn out the forms you require when you need them. Shipments can be scheduled to meet your requirements. Call on Form-Crete, rely on Form-Crete for the finest in all-steel forms all the time.

YOU GET—EXPERIENCED ENGINEERING ASSISTANCE—FREE

Long known as the pioneer manufacturer of all-steel forms, Form-Crete engineers have years of valuable experience to offer you. This free engineering service is made without cost or obligation. Oftimes a standard form can be modified to meet your needs. And if a custom unit is required, Form-Crete engineers have the know-how to produce it for you in the shortest time.

Be sure you see the

NEW FORM-CRETE FORMS

Engineered to save stripping and setup time . . .

ON DISPLAY
PCI CONVENTION
NOV. 1-7 Booths 56-57

fmc FOOD MACHINERY AND CHEMICAL CORPORATION®

Putting Ideas to Work

Form-Crete Department

General Sales Offices:
Lakeland, Florida — Riverside, California

PF-17A

FOOD MACHINERY AND CHEMICAL CORPORATION
FORM-CRETE Department
LAKELAND, FLA. • RIVERSIDE, CALIF.

Please send me your Form-Crete General Catalog
Please send me information on the new Single T Form

Name_____

Street Address_____

City_____ Zone____ State_____

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

SCAFFOLDING—A new folder describes more than 200 ways to scaffold and shore a wide range of construction projects. Entitled "Idea File on Efficient Scaffolding and Shoring Methods," the booklet is a compilation of articles that have appeared in the past five years in "Scaffolding Methods," published by The Patent Scaffolding Co. Each job writeup illustrates an efficient method of meeting a scaffolding or shoring problem.—**The Patent Scaffolding Co., 38-21 12th St., Long Island City 1, N.Y.**

PRE-BUILT CONVEYORS — Link-Belt has published a handbook on the use of standardized Pre-Bilt sectional belt conveyors. These conveyors are pre-engineered and shop assembled from matched components. A total of 22 components and accessories are listed in the book, "Pre-Bilt Sectional Belt Conveyors." — **Link-Belt Co., Prudential Plaza, Chicago 1, Ill.**

BITUMINOUS PLANT—A 24-p catalog issued by Iowa Mfg. Co. describes the Cedarapids G40A, G50A, and G60A batch-type bituminous mixing plants with capacities to 7,500 lb. It illustrates the self-erecting mechanism, automatic controls, inclined elevator, vibrating screen, sloped bin dividers, pugmill paddle tips, and dust elimination system.— **Iowa Mfg. Co., Cedar Rapids, Iowa.**

SLAB FORMS—A 4-p folder by Pittsburgh Steel Co. explains the applications of Fab-Form, a permanent corrugated steel base for concrete floor or roof slabs poured over beams or joists. A description of its physical properties and method of erection are included. —**Pittsburgh Steel Co., Grant Bldg., Pittsburgh 30, Pa.**

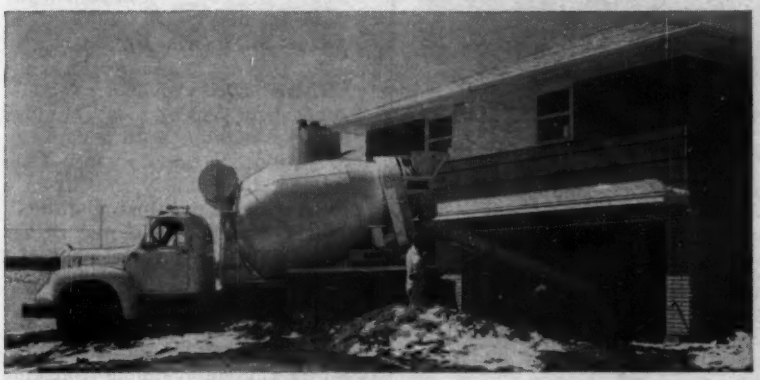
MOTOR GRADERS—"More For Your Money" is the title of a 16-p brochure describing the LeTourneau-Westinghouse line of mo-

ALPHA

BETTER CONSTRUCTION THROUGH BETTER USE OF CEMENTS

news and notes from the field

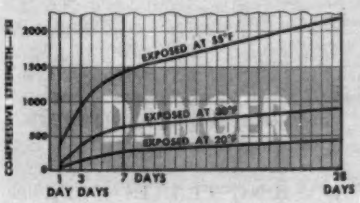
Tips For Cold Weather Concreting



Cold weather need not interfere with your concrete construction progress. Concrete work of all kinds has been done in extremely cold weather, and winter concreting can be of equal or even better quality than that placed in warm weather. Certain precautions must be observed, however, and an understanding of the effects of low temperatures on new concrete is necessary.

Effects of Low Temperatures

Low temperatures retard the rate at which concrete hardens and gains strength. Near 32°F. the rate is very slow, and below freezing there is almost no increase in strength.



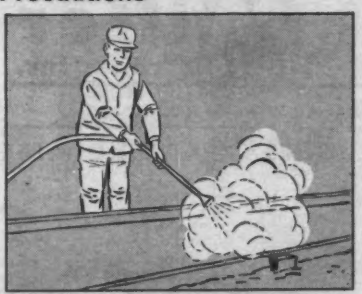
Same mix at 70°F temperature would provide 3250 p.s.i. at 28 days.

Concrete gains strength slowly at low temperatures. To obtain the given design strength in severe weather, additional cement or high-early strength cement may be necessary.

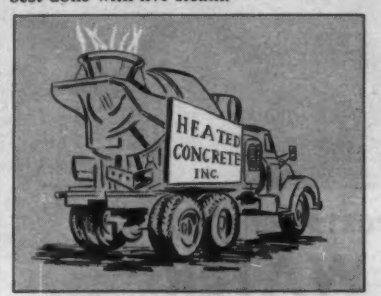
More Information

Send for Alpha's "Craftsmanship in Concrete" Folder #3 on cold weather concreting.

Precautions

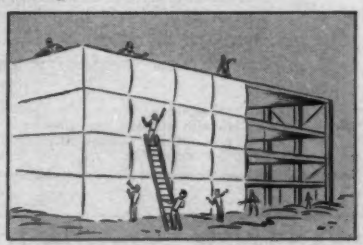


Subgrade must not be frozen or muddy. Remove all ice and frost from inside the forms and from reinforcing steel. This is best done with live steam.

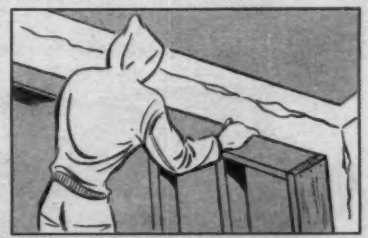


Use heated concrete when air temperature is expected to be 40°F. or lower within 24 hours of placing. Temperature of heated concrete should be at least 70°F.—*never* above 80°F. (Mass concrete excepted.)

Delay final finishing of flat surfaces to allow for slow set when using cool concrete. Too early final finishing causes dusting.



Concrete must be properly placed and protected for at least 72 hours even though heated concrete is used.



Leave forms on longer in colder weather. Never continue stripping forms if concrete is marred as removal is started.

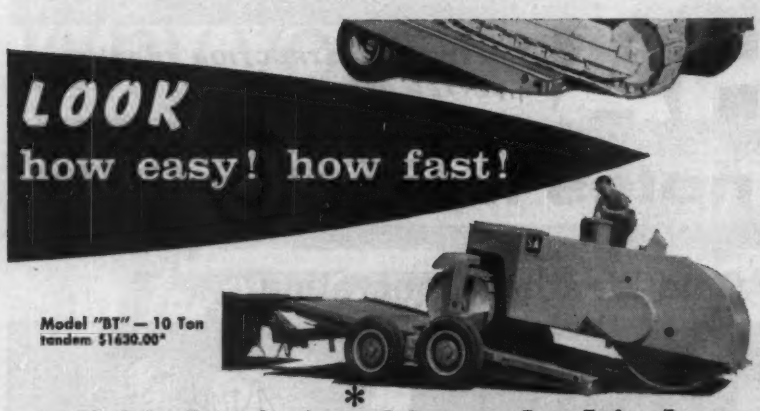
"Antifreeze" Mixtures

There are no known compounds that can be used in sufficient quantity to prevent concrete from freezing without harming the concrete itself. It is recommended that calcium chloride—which accelerates strength gain—should not be used in excess of 2% by weight of the cement. The chloride should be dissolved in water before use.

ALPHA

PORTLAND CEMENT COMPANY

Alpha Building, Easton, Pa.



*

...all kinds of rigs *drive on* load in less than two minutes on a MILLER *Tilt-Top*

Here is real speed . . . and ease, for hauling any kind of rig, whether on wheels, crawler treads or rollers. You just drive on, or drive off. Labor loading cost: two minutes of one man's time. Whatever you haul . . . trenchers, dozers, front-end loaders, backhoes, pavers, graders, or cranes . . . from 4 to 22 tons . . . there's a MILLER Tilt-Top with between the wheels or over-the-wheels platform; single or tandem axle suspension, that'll haul 'em faster! easier! See these production boosters at your MILLER distributor's today!

New capacity range — 4 to 22 tons!

*F.O.B. Milwaukee, Wis.
Complete with platform and tires.
Brakes and optional equipment extra.
**Plus 10% Federal Tax*

Miller Tilt-Top Trailer Inc.

457-A South 92nd Street, Milwaukee 14, Wis.

BRAND-NEW ADDITION TO HUGHES EXPANDING FLEET

DEFEAT RISING TRANSPORTATION COSTS . . .

SHIP BY WATER!

50
ALL STEEL VESSELS
ALL CAPACITIES
100 Tons To 2000 Tons
20' to 327' Long
25' to 70' Wide

Heavy duty sea scows and dependable inland waterway craft bring down Contractors' costs for transporting massive machinery, fabrications and construction supplies.

Over 60 Years Experience . . . the custom built charter fleet of barges, scows and floating equipment available from Florida to Maine, on Inland Waterways and St. Lawrence Seaway. Prompt attention to your inquiries.

JAMES HUGHES, INC.
I.CC W-463
17 Battery Place, New York 4, N. Y. Tel. WHitehall 4-1048
CLEARING HOUSE FOR MARINE DIFFICULTIES SINCE 1894

NEW PUBLICATIONS . . .
continued

tor graders. Photographs and diagrams illustrate seven models of graders ranging from 67 to 190 hp, and including two Power-Flow models with torque converter transmissions. The other graders have eight forward, four reverse, and three optional creeper speeds. Copies available from local dealers. — **LeTourneau-Westinghouse Co., 2301 N.E. Adams St., Peoria, Ill.**

CRANE EXCAVATOR — The American 500 series crawler crane-excavator, with a capacity of 40 tons, is featured in a 24-p catalog. Its mobility, plus its easy conversion to dragline, clamshell, shovel, backhoe, and pile driver are illustrated.—**American Hoist and Derrick Co., St. Paul, Minn.**

WELDING MACHINES — Arc welding machines are detailed in a 24-p catalog available from Hobart Brothers Co. It includes complete specifications on gasoline and diesel engine-driven welders, welder-power combination units, electric motor arc welders, rectifier type welders, transformer type welders, ac and dc inert gas shielded arc welders, and a line of automatic and semi-automatic welding equipment. — **Hobart Brothers Co., Troy, Ohio.**

SCRAPER AND WAGON—A 36-p catalog describes International's new Model 495 Payscraper and Paywagon. It details design features of the scraper, which has a 34 cu yd heaped capacity, and the bottom dump wagon, which has a heaped capacity of 40.5 cu yd. It also illustrates the tractor and 375 hp DT-817 diesel engine that powers the rig. Copies available from local dealers.—**International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**

WASHING PLANTS — Pioneer Engineering describes its Hydro-Screen principle of washing and screening aggregates in an 8-p bulletin. It contains a drawing of the basic Hydro-Screen plant, supplemented by drawings of several different models, each designed to meet a different aggregate washing problem. It also gives detailed information on the entire Hydro-Screen plant line. —**Pioneer Engineering, 3200 Como Ave., Minneapolis 14, Minn.**

continued on page 194

MUSCLES under the mainline!

Rodgers Hydraulic Jacks

push three 88 foot tiles under railroad without disrupting traffic

Two 200 Ton Rodgers Hydraulic Jacks were selected by W. J. Irwin & Sons, Inc., Tonawanda, N. Y. for driving three sewer pipes of 96" I. D. reinforced concrete tile 88' under the mainline of the New York Central Railroad. Part of a 2½ million dollar sewer contract on the Tonawanda West Side Drainage Project, the "push pipe" method was preferred because it permitted unrestricted use of the rail right-of-way overhead.

TIME: 34 DAYS—Actual jacking time consumed 34 days based on three-eight hour shifts a day. Each sewer took eleven 8-foot tile sections. The *First Line* required 14 days; the *Second Line* 11 days and the *Third* only 9 days.

Steel rails cradle tile sections as twin Rodgers Jacking Cylinders press against the wooden jacking frame. Heavy grease on outside of tile cuts down friction—for easier sliding.

Rear of excavation pit showing Hydraulic Jack against abutment wall. At this stage the ram is extended approximately ⅓ of the 48" ram travel.

ADVANTAGES OF HYDRAULIC JACKING—This job was handled at low cost and was unique due to the short time required for completion and the fact that rail service overhead continued uninterrupted throughout the tunneling project below. Entirely different from conventional tunneling, the "push pipe" method also provides greater safety to workers from cave-ins since they work inside the tile that is being driven.

JACKING PROCEDURE—A service pit 28' deep by 22' wide by 40' long was excavated to house the jacking equipment. A pair of 75 lb. steel rails placed on the concrete pit floor cradled the tile sections and acted as a guide for the jacking operation. Type of soil encountered in all three pipes was a mixture of heavy yellow and blue clay.

EQUIPMENT USED—Two 200 Ton Rodgers Hydraulic Jacks with 48" ram travel were powered by a Rodgers Model D2 electric driven hydraulic pump located at the top of the excavation pit. A valve panel located at the bottom of the pit permitted accurate control of the jacking operation.

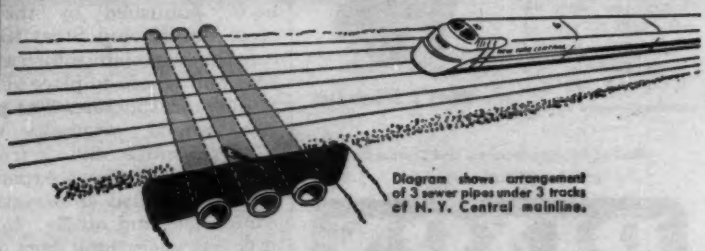


Diagram shows arrangement of 3 sewer pipes under 3 tracks of N. Y. Central mainline.

If you'd like more details about this job, write for free copy of Bulletin 331.

Rodgers Hydraulic Inc.

7403 Walker St. • Minneapolis 26, Minnesota

Avoid One Cause of Air Line Leaks and Pressure Loss

"BOSS"
Self-Honing
AIR VALVES

Female I. P. T. Both Ends

Built to withstand the hard knocks of mining and construction service, "BOSS" Valves are also ideal for general use on pipe lines, hose lines, compressor tanks, etc., and for the handling of water. They do not require packing.

Bronze plug firmly seated by spring tension against harder metal of valve body is automatically honed to perfect seat as handle is turned. A straight, full-flow opening extends through valve body and plug, providing greater capacity with no friction loss. Valve opens or closes by a quarter turn of the handle.

INTERNALLY ATTACHED HANDLE—In sizes ¾" to 1½" valve stem and handle are combined in a strong one-piece forged steel unit which is anchored to the bronze plug within the valve body. This patented feature eliminates stem and handle breakage. Sizes ¼", ⅜", ½" and 2" have externally riveted handles.

Male I. P. T. Both Ends

Stocked by Manufacturers and Distributors of Industrial Rubber Products

DIXON
Valve & Coupling Co.
GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
BRANCHES—CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON
DIXON VALVE & COUPLING CO., LTD., TORONTO, Associate Companies

NEW PUBLICATIONS . . .
continued

SOLDERING MANUAL—Soldering methods are detailed in a 176-p manual by the American Welding Society. It includes 21 chapters, each covering a different phase of the subject. It gives chemical compositions of hundreds of solders together with flux formulations for various metals. Price, $5. — **American Welding Society, 33 West 39th St., New York 18, N. Y.**

COMPRESSED AIR — "Compressed Air Fundamentals," published by Ingersoll-Rand, describes how air is compressed, single and two stage compressors, piston displacement, actual delivery, unloading of compressors, regulation, and types of controls. The 16-p booklet contains chart information on cubic feet of air required to operate a variety of pneumatic equipment.—**Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.**

WHITE PORTLAND CEMENT—A 24-p catalog issued by Universal Atlas Cement describes the uses and applications of Atlas White Portland Cement. It contains special mixing instructions, details its properties, and explains air-entraining and waterproofed types.—**Universal Atlas Cement Div., U. S. Steel Corp., 100 Park Ave., New York 17, N. Y.**

CONCRETE MIXER—A 6-p bulletin presents complete information on Rex Tilt-Up Mixers for ready-mix plants, Porto-Plants, and central-mix paving. It illustrates installation and mixing advantages of the mixers.—**Chain Belt Co., Milwaukee 1, Wis.**

PLACING RE-BARS — A 281-p book, published by the Concrete Reinforcing Steel Institute, contains complete information on how and where to place reinforcing bars in concrete. The pocket-size manual, originally written for apprentice and journeyman bar setters, has been expanded to include detailed information for contractors and others. In scope, it covers everything from unloading and storing re-bars to a description of the various types of reinforced concrete construction. Price, $3.—**Concrete Reinforcing Steel Institute, 38 South Dearborn St., Chicago, Ill.**

SEARCHLIGHT SECTION
(Classified Advertising)

EMPLOYMENT · BUSINESS EQUIPMENT — USED OR RESALE

OPPORTUNITIES

DISPLAYED RATE

The advertising rate is $21.75 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

Employment Opportunities $29.33 per inch, subject to agency commission.

An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.

UNDISPLAYED RATE

$2.10 a line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Positions Wanted undisplayed advertising rate is one-half of above rate, payable in advance.

POSITION WANTED

Seeks new situation in mining, construction, materials handling equipment or concrete products. Penna., Ohio, N. Y. region preferred. PW-2742, Construction Methods & Equipment, Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

LABOR RELATIONS

Opening for top qualified man with national firm in Midwest. Requires 4 years' heavy experience in building trades, intimate knowledge of international and local craft union practices and agreements, and ability to operate on a policy-making level. Salary open.

Reply in confidence to

P-2645, CONSTRUCTION METHODS & EQUIPMENT
520 N. Michigan Ave.
Chicago 11, Ill.

Wanted
SALES REPRESENTATIVE

Leading manufacturer of asphalt plants has opening for hard-hitting sales representative. Prefer salesman with prior asphalt plant experience. Dealer organization long established. Salary, travelling expenses and bonus arrangement. Good opportunity with one of oldest manufacturers. Reply SW-2892, Construction Methods and Equipment, P.O. Box 12, New York 36, New York.

Bethlehem Hollow Drill Steel Speeds Rock Removal at Niagara Power Project

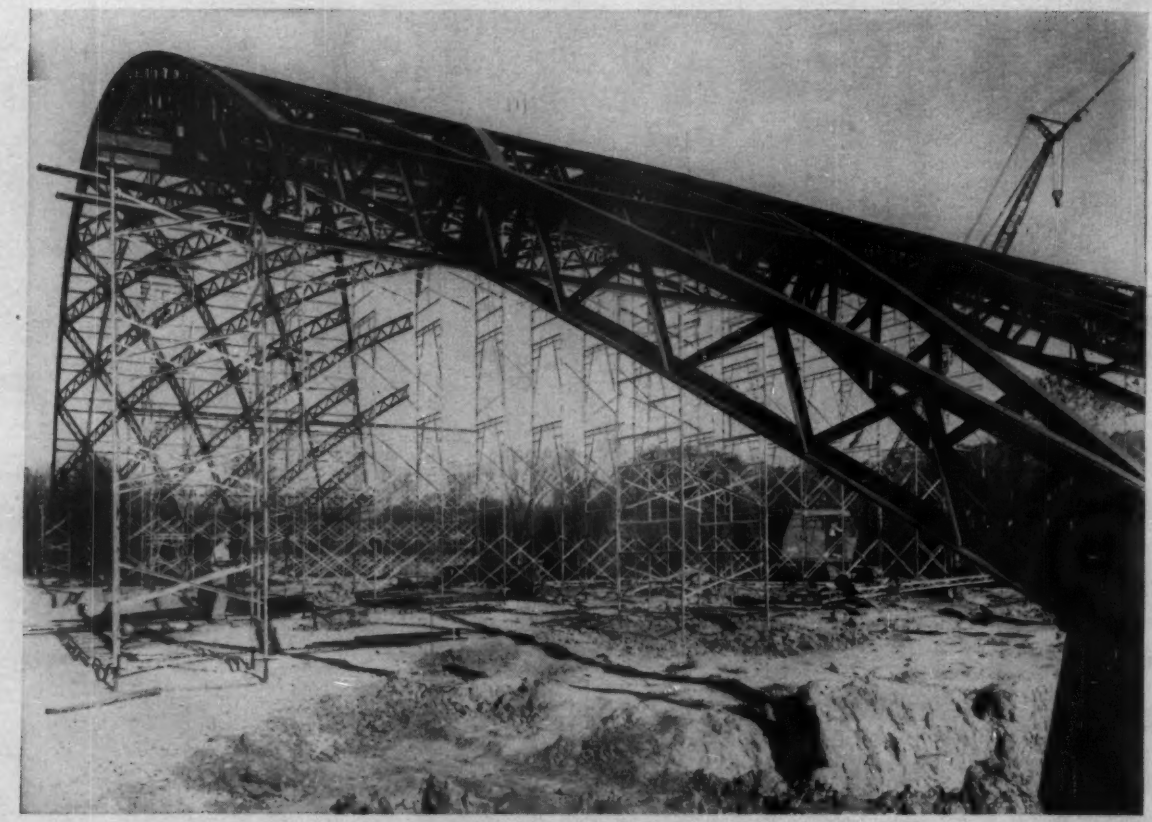
This battery of wagon drills is boring blast holes for the Balf-Savin-Winkelman section of a 4-mile trench at the Niagara Power Project. When completed, the trench will accommodate twin 46 ft x 66 ft underground conduits, which will carry water from the Niagara River to a 1,950,000-kw power plant now taking shape several miles below Niagara Falls. On this and other major projects, Bethlehem Hollow provides dependable, low-cost drilling under the most rugged conditions. This "old reliable" steel is available in both Carbon and Ultra-Alloy grades.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributors: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



STEEL LAMELLA roof construction on new Ladue H.S. Auditorium, St. Louis, being shored with "Trouble Saver" Steel Shoring. Cristina Constr. Co., gen. contr. Kroger Erection Co., steel erectors. One of three recent jobs, see below.

New Shoring Method Cuts Steel Erection Time 20%

THE USE of prefabricated PS Co. Steel Shoring components as temporary cribbing for the support of steel beams and girders on three recent steel erection jobs is now showing that erectors can save up to 20% of the time needed on job completion dates over former methods. Steel shoring offers the same money-saving advantages to steel erectors as it does to concrete contractors.

Considerable materials and equipment savings are being evidenced. The pre-fab steel shoring components are more easily and quickly handled and assembled, are completely reusable, and can be *rented* for the particular job. Mobile cranes and other heavy equipment can be kept down to a minimum, as well.

Three types of equipment are available for shoring of steel:

1—Standard components of prefabricated "Trouble Saver"® Sectional Steel Shoring, consisting of 3′ to 6′6″-high end frames, diagonal braces for a variety of frame spacings, fast-acting Slide-Loks, bases, U-heads and adjustable screw legs.

2—Extra Heavy Duty Shoring, consisting of 3½″ dia. legs which can be spaced in multiples of 6′4″ or 8′ in both directions, braces and girts. Sections are 6′6″ high.

3—"TubeLox"® Steel Shoring, consisting of interlocking 2″ or 2½″ O.D. tubular steel members in 6′ to 20′ lengths, right angle couplers, adjustable couplers, diagonal braces, bases and "TubeLox" wrench.

Modern shoring equipment speeds steel erection on these three typical construction jobs:

Ladue H. S. Auditorium, see photograph above.

New Hangar No. 17, Idlewild Airport, N. Y., with 158′-long steel box girders shored with 16 towers, each side, made of Extra Heavy Duty Steel Shoring components. White Plains Iron Works, Inc., steel erectors.

Steelwork for the new overpass over downtown St. Louis shored with "TubeLox" Steel Shoring. St. Louis Steel Erection Co., contractors.

THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street, Long Island City 1, New York

Branches in all principal Cities

SHORING METHODS FOR STEEL AND CONCRETE CONSTRUCTION

Complete scaffolding equipment and engineering service offered through nation-wide sales offices or representatives. Look under Patent Scaffolding in the Yellow Pages for your nearest source.

SALES RENTALS

Advertisers in this month's

Construction Methods AND EQUIPMENT

330 WEST 42nd STREET, NEW YORK 36

McGRAW - HILL

LOngacre 4-3000

Number of copies of this issue printed 51,268

A

Acme-Hamilton Manufacturing Corp. 151
Allis-Chalmers 52-53, 148-149, 161
Allison Div., General Motors Corp.....118-119
Alpha Portland Cement Co. 191
Aluminum Co. of America.....186-187
American Bridge Div., United States Steel Corp. 38-39
American Gage & Mfg. Co. 102
American Hoist & Derrick Co. 139
(Crosby-Laughlin Div.) 108
American Manganese Steel Div. American Brake Shoe Co. 112-113
Armco Drainage & Metal Products, Inc... 109
Atlas Copco 166
Austin-Western Works, Construction Equip. Div., Baldwin-Lima-Hamilton Corp. 168-169

B

Barber-Greene Co. 140
Bethlehem Steel Co. 170, 180, 195
Broderick & Bascom Rope Co.....2nd Cover
Bucyrus-Erie Co. 103
Butler Bin Co. 144

C

Caterpillar Tractor Co. 42-43, 93, 94-95, 96
Chevrolet Div. General Motors Corp. 69, 70-71, 72-73, 74-75, 76
Cities Service Oil Co. 152
Cleveland Trencher Co. 150
Crosby-Laughlin Div., American Hoist & Derrick Co. 108
Cummins Engine Co. 18-19
Curtiss-Wright Corp. (South Bend Div.).. 155

D

John Deere Industrial Div. 28
Dixon Valve & Coupling Co. 194
duPont de Nemours & Co., Inc., E. I....16-17

E

Eimco Corporation 10
Electric Steel Foundry Co. 129, 130
Euclid Div. General Motors Corp. 33, 34-35, 36

F

Filotechnica Salmoiraghi, Inc. 172
Firestone Steel Products Co. 110
Food Machinery & Chemical Corp. (Form-Crete Dept.) 190
Ford Motor Company (Ford Division) 104-105
(Industrial Engine Div.) 124
Fram Corporation 65
Fuller Manufacturing Co. 138

G

Gardner-Denver Co. 6
Gates & Sons, Inc. 188
General Tire & Rubber Co., The..... 46
Goodrich Industrial Products Co., The B. F. 80
Goodrich Tire Co., B. F. Div. The B. F. Goodrich Co. 1
Gradall Div., Warner & Swasey Co..... 5
Griffin Wellpoint Corp. 2
Gulf Oil Corp. 164-165

H

Hartford Machine Screw Co. Div. Standard Screw Co. 131
Heltzel Steel Form & Iron Co. 179
Hendrickson Manufacturing Co. 137
Hetherington & Berner, Inc. 8-9
Homelite Div., Textron, Inc. 184
Hough Co., The Frank G. 153
Hughes, Inc., James 192
Hydroway Scales, Inc. 172

J

Jaeger Machine Co. 30-31
Johns-Manville 78-79

K

Koehring Company (Koehring Div.)..... 56

L

Lehigh Portland Cement Co. 29
LeTourneau-Westinghouse Co. 24-25, 26-27
Liberty Mutual Insurance Co. 123
Lima Works, Construction Equipment Div. Baldwin-Lima-Hamilton Corp. 32

M

Mack Trucks, Inc. 54-55
Macwhyte Wire Rope Co. 3
Manitowoc Engineering Corp. 77
Marquette Manufacturing Co., Inc. 175
Massey-Ferguson Industrial Div. 147
McGraw-Hill Book Co. 154
Miller Electric Mfg. Co., Inc. 126
Miller Tilt-Top Trailer, Inc. 192
Minneapolis-Moline Co. 189
Moretrench Corp. 49

N

Nordberg Manufacturing Co. 58-59
Northwest Engineering Company..... 7

O

Owatonna Tool Co. 181

P

Pacific Mercury Mfg. Corp. (Joplin Div.) 172
Patent Scaffolding Co., Inc. 196
Perfect Circle Corp. 50
Porter Co., Inc., H. K. (Locchen Wire Rope Div.) 146
(Thermoid Div.) 166
Purolator Products, Inc. 60-61

R

Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp. .. 159
Raybestos-Manhattan, Inc. (Manhattan Rubber Div.) 66-67
Richmond Screw Anchor Co. Inc. 51
Rockwell Standard Corp. (Transmission & Axle Div. Detroit) .. 62
Rodgers Hydraulic, Inc. 193
Rogers Bros. Corp. 183

S

Safway Steel Products, Inc. 97
Schramm, Inc. 37
Shell Oil Co. 21
Sinclair Refining Co. 134
Spencer Chemical Co. 173
Standard Oil Co. (California)..... 143
Standard Oil Co. (Indiana).....44-45
Standard Steel Corp. 115
Stang Corp., John W. 178
Superior Concrete Accessories, Inc. 174
Symons Clamp & Mfg. Co. 23

T

Templeton, Kenly & Co. 160
Texaco, Inc. 14-15
Thew Shovel Co. 159
Timken Roller Bearing Co.....4th Cover
Travelers Insurance Companies, The 3rd Cover
Twin Disc Clutch Co. 98

U

Union Wire Rope Corp. 176-177
Unit Crane & Shovel Corp. 171
United States Rubber Co. (Mechanical Goods Div.)..... 40
United States Steel Corp. 22, 38-39
Universal Atlas Cement Div. United States Steel Corp. 22

V

Viber Company 182
Vickers, Inc. Div. Sperry Rand Corp. 13

W

Waco Manufacturing Co. 154
Warner & Swasey Co. (Gradall Div.).... 5
Water Seals, Inc. 20
Waukesha Motor Co. 162
Wickwire Spencer Steel Div. The Colorado Fuel & Iron Co..... 163
Wisconsin Motor Corp. 142
Wix Corp. 145

Y

Yale & Towne Mfg. Co., The (Trojan Div.) 127

■

CLASSIFIED ADVERTISING

F. J. Eberle, Business Manager

Employment Opportunities 194
Equipment (Used or Surplus New) For Sale 194

SALES REPRESENTATIVES

New York 2, 500 Fifth Ave.
L. S. KELLY, JR.

Philadelphia 3, Six Penn Center Plaza
H. THOMAS McCARREN

Atlanta 3, 1301 Rhodes-Haverty Bldg.
M. H. MILLER

Cleveland 13, 55 Public Square
W. E. DONNELL

Chicago 11, 520 N. Michigan Ave.
EDWARD L. WILANDER
MELVIN B. NYLUND
GEORGE K. SMITH

Dallas 1, The Vaughn Bldg. 1712 Commerce St.
GORDON JONES
F. E. HOLLAND

Denver 2, Mile High Center, 1740 Broadway
JOHN W. PATTEN

Detroit 26, 856 Penobscot Bldg.
J. L. RICE

Los Angeles 17, 1125 West Sixth St.
S. S. TIEBOUT

San Francisco 4, 68 Post St.
J. W. OTTERSON
SCOTT HUBBARD

Europe: McGraw-Hill House, 95 Farringdon St., London E.C. 4, England
E. E. SCHIRMER

McGraw-Hill Publishing Co., Inc. 85, Westendstrasse, Frankfurt/Main, Germany
MICHAEL R. ZEYNEL

Other Sales Offices:
St. Louis 8: Continental Bldg.
Pittsburgh 22: 1111 Oliver Bldg.
Boston 16: 350 Park Square Bldg.

Methods Memo...

'Plan Bulldozer' in Action

These Cat D8's dozing rock in fast-running water and the machines on the far bank are part of the emergency force Montana contractors mobilized to repair the damage caused by a severe earthquake.

The series of tremors dumped more than 40,000,000 cu yd of earth and rock across Madison River. Water began to build up behind the slide, and a spillway had to be cut across the slide before the water burst through.

The Montana Contractors' Association called on its members to speed men and machines to the slide area. Equipment began to arrive within 24 hours; within a few days there were $3 million of construction equipment and about 150 construction men working there.

They cut a spillway almost a mile long and lined it with rock to prevent erosion. Now they are working on a stilling basin at the toe of the slide. By the middle of November they will have moved 2,000,000 yd of earth and rock.

This is the first time Plan Bulldozer, the disaster relief plan of the Associated General Contractors, has gone into action. Gov. Hugo Aronson of Montana called the contractors' response "magnificent."

Trends in Equipment Rentals

Rental rates for all types of construction equipment average a little higher now than a year ago, according to the 11th edition of the Green Book, a compilation of rental rates published by the Associated Equipment Distributors.

But in this case the average doesn't tell the whole story. A number of the most widely used machines cost less to rent this year than last. AED says the reason for the significant number of lower rates is the stiff competition in some areas for rental business and the increase in used equipment inventories.

Here are the trends in rental rates for most popular types of equipment. For a copy of the Green Book, write to AED at 30 East Cedar St., Chicago 11, Ill.

Power Shovels — Majority of units down, with declines of 4% to 5% on some sizes.

Tractors — Rates for gear-drive diesels average 1.7% higher, but torque converter types are down 1%.

Scrapers — Changes are spotty, ranging from declines of 5% to increases of 6%.

Motor Graders — Upward trend in lighter, gasoline-powered models and in diesel types with torque converters. Rentals tend to be down for heavier gasoline models and for diesel units with conventional transmissions.

Front End Loaders — Crawler-mounted units are down; declines range from 1% to 13%. Wheeled diesel models are down an average of 2%, but gasoline units are up about 5%. Front wheel drive rigs are down an average of 3%.

Cranes — Crawler types show a moderate rise in rentals, but truck-mounted cranes tend to be lower—except for slight increases in larger, diesel-powered units.

Forklift Trucks — Average is up, but the range is wide — from —7% to +14%.

Pumps — Concrete pumps are down 1% to 7%, but centrifugal pumps and diaphragm pumps average slightly higher.

Rollers — All models are down; drops range to as much as 16%.

Wagon Drills — Crawler-mounted types are up sharply, and towed types are as much as 7% higher.

Heat Does the Trick

This asphalt roller, now undergoing laboratory testing, carries a propane tank that supplies fuel to burners in each roller.

Tests indicate the heated rollers enable the 1-ton machine to produce approximately the same compaction as a standard 5-ton tandem roller.

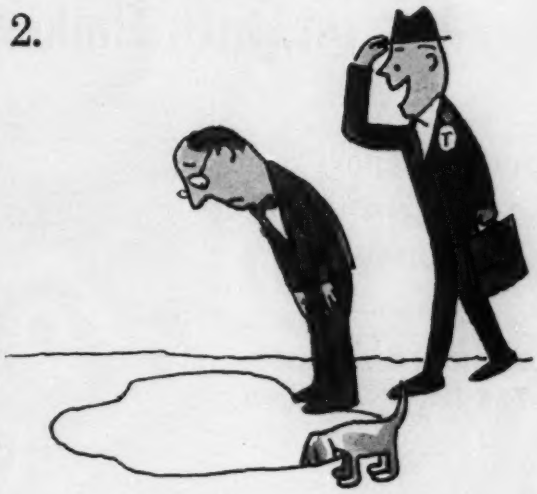
A 7-hp Wisconsin engine powers the roller through a chain drive to the rear roller. Front roller is 18-in. in dia; rear roller is 21 in. in dia. The machine was built by Ellis Manufacturing Co. of Liberty, Mo.

How Bob's downfall proved a windfall

1.

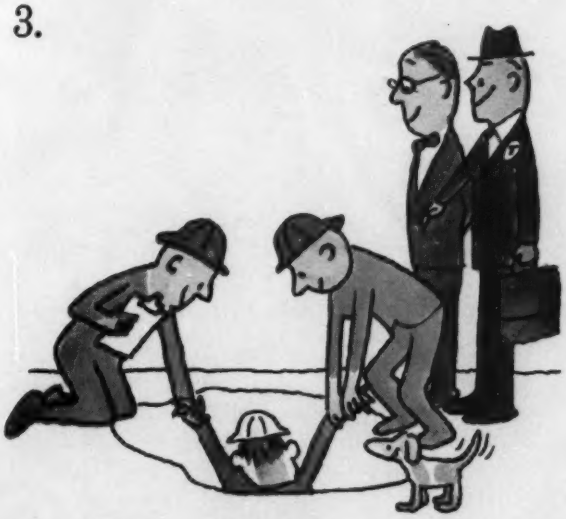
Bob Taylor won the contract—'twas a much combated prize—
To dig an underground garage of vast, majestic size.
"Let's excavate to China," Taylor cried, "let's see 'em roll!"
"Yes, *sir!*" replied a foreman, then fell plunk into a hole.

2.



Poor Bob was glum as people come. A Travelers man heard all.
"Hereafter," he suggested, "let The Travelers take the fall,
For under Workmen's Comp and Public Liability,
When workmen or some passer-by gets hurt, we pay the fee.

3.



"But best of all, our safety engineers survey each site,
To find those hidden hazards and to help to set them right.
Statistics all confirm the fact that Travelers safety service
Reduces costs and accidents, saves you from being nervous."

4.

"Exactly what I need," cried Bob, "you don't have to cajole."
The excavation's going great. Bob won't be in the hole!
If *you're* about to build a road, a tunnel, bank or hall—
Secure the plan! Just give a trusty Travelers man a call.

NOTE: *Bonds, Equipment Floaters—Builders' Risk Insurance, too Are other ways The Travelers helps a contractor like you.*

THE TRAVELERS
Insurance Companies
HARTFORD 15, CONNECTICUT

All forms of business and personal insurance including Life • Accident • Group • Fire • Marine • Automobile • Casualty • Bonds

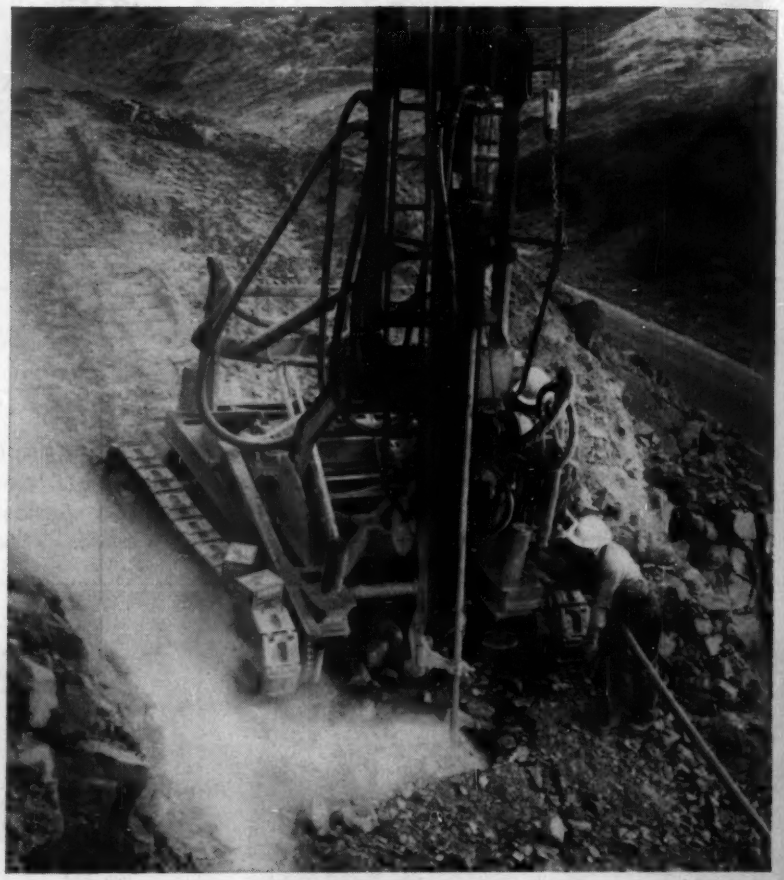
"We drilled over 5,000 ft., averaging 15 redresses per bit, with Timken® carbide insert bits"

Special report from Rogers Construction Company

LOCATION: U. S. HWY. 30, THE DALLES, OREGON

Operating conditions: Lava-Basalt

In converting part of U. S. 30 from a two-lane to a four-lane highway, Rogers Construction Co. of Portland, Ore., had to drill through Lava-Basalt. Holes in this very fryable rock varied from 25 to 60 feet. And for drilling on this very abrasive ground, Timken® carbide insert bits were a "natural". They set records. Some of the original 010 4½" bits have drilled well over 5,000 ft., averaging 15 redresses per bit.



Which Timken Bit should you use?

In hard, abrasive ground, the Timken carbide insert bit gives you greatest economy. But in softer ground, use the low-cost Timken all steel multi-use bit. Both bits are interchangeable in the same thread series; you can switch bits as the ground changes. What's more, dozens of different Timken bits fit the same drill steel. And both types are made from Timken electric furnace fine alloy steel, have special shoulder unions to protect against drilling impact. Let us help you select the right Timken bit for your job. Call or write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

TIMKEN®
REMOVABLE ROCK BITS